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GASTROSCOPIC OBSERVATIONS IN PERNICIOUS ANEMIA*

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THE flexible gastroscope (Schindler) offers an additional means of examination of the gastric mucosa in pernicious anemia. Early histologic studies of the postmortem gastric mucosa have long since established the fact that gastritis with atrophy is the constant finding. The very earliest examinations, of Hunter and others, were open to the objection that postmortem changes were not inhibited, but when Faber¹ and Bloch (1898) adopted the suggestion of Damaschino (1880) and Chauffard (1882) of formalizing the stomach and peritoneal cavities immediately after death, thus fixing the delicate tissues before change could occur, these objections were no longer valid. Meulengracht² has more recently substantiated these findings, again on postmortem material.

Studies on functional activity have been made, particularly with respect to the inability of the atrophic mucosa in pernicious anemia patients to form hydrochloric acid. Since the use of histamine as a stimulant, this work has become standardized and tends to show that achlorhydria is a constant finding, not favorably influenced by therapy. Castle and others, following up the hypothesis that there is an intrinsic element of, or elaborated by, the gastric mucosa, necessarily present as a component of the complex of factors protective against the occurrence of pernicious anemia, have demonstrated that such a factor does not return to the organism in response to liver therapy. The relationship of this factor to the achlorhydria or the atrophic condition of

the mucosa is as yet not clearly defined. Meulengracht² and Morrison⁴ have advanced theories, yet awaiting final proof.

By this time many cases of pernicious anemia have been examined gastroscopically, and the presence, always, of an atrophy of greater or less degree has been noted. Whether this condition is amenable to change by adequate liver therapy has been discussed, and favorable and unfavorable results have been recorded. The earliest report was that of Benedict et al³ in 1935, but the cases upon which they based their conclusions were, perhaps, not just the sort of cases in which such conclusions would be warranted. Of five patients reported, three had polypi and two had carcinoma of the stomach. Two of those with polypi as well as the two with carcinoma were operated upon. Two of these operations were done before gastroscopic observations were made, and there is nothing in the record to show what therapy, if any, was instituted after operation. Bleeding was undoubtedly a factor in most of the cases. The association of polypi with atrophic gastric mucosa and anemia, or the association of carcinoma with a macrocytic type of anemia and atrophy of the gastric mucosa is not uncommon.

Schindler⁵ has more recently reported that he has seen the return to a normal condition of the gastric mucosa of some pernicious anemia patients who had shown atrophy of mucosa on original examination, following adequate liver therapy. His report includes four patients with pernicious anemia in whom he saw normal mucosa after treatment, although he had not examined them before treatment, and three patients observed before and after treatment, in one of whom

*From the Gastroscopy Clinic, Dispensary, Medical School, University of Minnesota, and the Medical Division, The Nicollet Clinic, Minneapolis, Minnesota. Read before the Minnesota Society of Internal Medicine, November 28, 1939, St. Paul, Minnesota.

the mucosa became normal, the other two still showing some atrophy, although not as extensive as at the original examination.

I have so far (750 examinations) not seen an indubitable case of pernicious anemia with a normal gastric mucosa. Moreover, I have not seen restoration to normal condition of gastric mucosa occur in any of the cases reexamined after treatment, although in some cases some evidence of regeneration was present. Fifteen patients who had been diagnosed unmistakably pernicious anemia by all the usual and accepted criteria were chosen. Six reexamined showed still very definite atrophic mucosa, although in two there was some improvement in that what were thought to be areas of regeneration were present. One was definitely worse, *i.e.*, the atrophy was more extensive. One had had inadequate treatment. One of the fifteen was examined for the first time when her blood was normal, having received liver extract for four years, but who had persistent gastric complaints; an actively inflammatory atrophic condition was seen. One of the fifteen had died, from what cause I do not know. Five of the fifteen did not respond to our request that they return for reexamination, and two of the fifteen who did come in could not be reexamined because of acute upper respiratory infection and have not been seen since. Another patient with marked mental changes was not reexamined and in another, because of complication of paralysis agitans, the examination was too difficult the first time to warrant repetition.

SUMMARY OF CASES

Number examined.....	15
Number re-examined.....	6
Worse—1	
Improved—2	
Unchanged—3	
Dead	1
Failed to return.....	5
Reexamination impossible.....	3

Case 1.—2-24-37 Atrophy. Hemoglobin 38, red blood cells 1,700,000. 7-7-37 no change. Hemoglobin 82, red blood cells 4,880,000. Therapy adequate.

Case 2.—3-3-37 Atrophy. Hemoglobin 56, red blood cells 2,480,000. 5-10-39 atrophy, slight effort of regeneration. Hemoglobin 88. Therapy adequate.

Case 3.—5-4-38 Atrophy. Hemoglobin 83, red blood cells 3,700,000. 6-15-39 no change. 5-27-38 hemoglobin 77, red blood cells 7,960,000. Therapy adequate.

Case 4.—1-18-36 Atrophy. Hemoglobin 52, red blood cells 2,980,000. 6-22-39 atrophy more marked. Hemo-

globin 97. Therapy probably not quite adequate in this case, as general condition was not very good.

Case 5.—5-1-36 Atrophy. Hemoglobin 70, red blood cells 3,860,000. 4-26-39 no change. Hemoglobin 64, red blood cells 3,080,000. Still some symptoms. Inadequate therapy.

Case 6.—2-3-37 Atrophy. Hemoglobin 53, red blood cells 2,260,000. 4-5-39 atrophy and areas of superficial gastritis. Hemoglobin 85, red blood cells 4,760,000. Considered adequately controlled.

Case 7.—9-14-38 Atrophy with inflammatory change. Hemoglobin 93. Not examined again. Patient considered to have been adequately controlled for four years.

Case 8.—4-13-38 Diffuse atrophy. Single polyp of anterior wall of stomach. Not reexamined because of paralysis agitans and diabetes.

Case 9.—9-21-38 Diffuse atrophy. Hemoglobin 50. 9-14-38 hemoglobin 35, red blood cells 2,040,000. Has had some liver but obviously inadequate amount.

Case 10.—5-27-36 Atrophy. Hemoglobin 42, red blood cells 2,350,000. Untreated. Patient died in 1938. Cause unknown.

Case 11.—11-4-36 Atrophy. Hemoglobin 76, red blood cells 3,220,000. Untreated.

Case 12.—11-25-36 Atrophy. Hemoglobin 41, red blood cells 1,900,000. Untreated.

Case 13.—12-2-36 Atrophy. Hemoglobin 40, red blood cells 1,500,000. Untreated. Returned 1939 but could not be reexamined because of acute upper respiratory infection.

Case 14.—2-3-27 Atrophy. Hemoglobin 38, red blood cells 1,180,000. Untreated.

Case 15.—2-7-37 Atrophy. Hemoglobin 54, red blood cells 1,680,000. Untreated. Not reexamined 1939 because of marked mental changes and lack of cooperation consequent thereon.

The reversion to a normal condition of the gastric mucosa in pernicious anemia patients treated with liver would be contrary to the pathologic and histologic studies of Meulengracht³ and Faber.⁴ Both of these authors have examined post-mortem material from pernicious anemia patients adequately controlled as to anemia and dying from intercurrent causes, and have always found an atrophic condition of the mucosa with gastritis. Changed conditions of general nutrition and blood elements brought about by liver therapy in pernicious anemia might conceivably result in some improvement in gross appearance of gastric mucosa, as to color and even in the direction of recession of atrophic appearance. But, in any condition of gastritis, the replacement of diseased gastric cells is by non-specific, simple, columnar epithelium and not by functional cells capable of secreting any of the supposed specific substances; and at times the regenerated mucosa has the characteristics of intestinal mucosa. This

is also in line with the other experimental evidence, namely, the hydrochloric acid does not return to the gastric secretion in pernicious anemia in spontaneous or induced remission, nor does the so-called intrinsic factor. Once an atrophic condition of the tongue has been established, a restitution to normal appearance does not occur during either spontaneous or induced remission. If liver therapy actually restored the gastric mucosa to normal and if the gastric mucosal cells thus regenerated were capable of acting as the normal glands should, then, not only hydrochloric acid, but also intrinsic factor should return to the economy of the organism, and the blood could be maintained in a normal condition without the further aid of liver—in other words the patient would be actually cured of his pernicious anemia.

This happy result has, so far, not been accomplished. Therefore, even if there is an apparent improvement in the atrophic condition of the gastric mucosa as seen gastroscopically in pernicious anemia patients as the result of liver therapy, such improvement would probably be because of replacement of atrophied mucosal elements by other new epithelium, probably of simple columnar type, sufficient to cover over the submucosa, hide the blood vessels and give the appearance of a normal gastric mucosa. Based upon the healing effects seen in other conditions, it is not likely that these replacement cells would be capable of performing the specific functions of the original, normal mucosa, and hence the lack of intrinsic factor, hydrochloric acid and other perhaps now unknown effective elements for anti-pernicious

anemia influence would still be lacking. The patient would still have pernicious anemia.

Until satisfactory histologic studies of the gastric mucosa of patients well controlled as to the pernicious anemia state, dying of some unrelated circumstance, have been made, conclusions based upon observations of gross conditions observed gastroscopically may not safely be extended beyond the point of description.

Supplementing the body's economy with what seems to be obviously lacking, seems to arrest the progress of the disease and to restore to apparent normal the hemologic elements; but the disease itself persists. As soon as liver is withdrawn from any individual, he more or less promptly relapses; the fundamental factors have been prevented from operating, but their existence has not been abolished. The gastric mucosa may be, by improving the blood and general nutrition of the pernicious anemia patient, apparently or actually regenerated, by some sort of reparative cells, from its atrophic state, but it is unlikely that the disease "pernicious anemia" is thereby permanently influenced.

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A PROPER AND ADEQUATE PROTEIN DIET FOR ELDERLY PEOPLE*

E. L. TUOHY, M.D., F.A.C.P.

Duluth, Minnesota

WE ARE becoming a nation of elderly people. This is modifying our practice to a degree that few appreciate. I ask a lenient attitude on your part and the privilege to indulge in some repetition. A year ago I spoke before this Society concerning the overriding of food and vitamin deficiencies, and reported upon the therapeutic potentialities of thiamin chloride. I demonstrated an instance of extreme gastric

atony and stasis in a man with tabes and diabetes where parenteral thiamin chloride promptly restored gastric tonus and emptying time. I have since encountered an extreme megacolon in an instance of alcoholic polyneuritis. This colon came back to normal size and function, but only after much more prolonged restoration of adequate diet and with thiamin chloride fortification. This type of atony is comparable to that occurring to the heart in beri-beri.

Many articles dealing with vitamins and nu-

*From The Duluth Clinic, Duluth, Minnesota. Delivered in part before the Minnesota Society of Internal Medicine, Saint Paul, Minnesota, November 27, 1939.

trition continue to appear. Vitamin concentrate manufacturers continue their vivid and eager display through every advertising medium. The good, the dubious, and the bad get equal emphasis. We are, indeed, in the midst of much propaganda but it must be granted whereas it is usually an evil agent, there must be something said for publicizing certain principles that, like "faith, hope, and charity," are inherently good. So it is with the material food supplies which provide human sustenance. Indeed, it is to secure an abundance thereof that we see developed the most debasing and disastrous of all propaganda—both economic and military. It is timely, therefore, not only to attempt to keep step in utilizing the specific products (vitamin concentrates and synthetics) but to scan the broader generalities uncovered by studies in food deficiencies that we may more sensibly adjudge man's needs at various ages or in certain environments. This simply means an attempt to outline for humans a "balanced ration" comparable to that which agronomists and schools of agriculture have effectively and scientifically devised for domestic animals.

Since the very expression "domestic animals" connotes their utilization for burdensome work and as sources of human food it should be unnecessary to reiterate that man came out of caves and developed modern contrasting rural and urban living, through animal husbandry. Considering the long mutual interdependence existing between man and domestic animals—horses, hogs, goats, cattle, sheep, and chickens—I wish to stress only the enormous contribution of animals to man through acting as concentrators of forage and materials too unwieldy for him to utilize. The almost overwhelming corn crop of our Middle West is marketed neither in sacks nor in jugs although garden portions reach our tables or our bars in those forms. The great bulk of our corn is sold in the form of beef and pork products. They are the best in the world. We should not render them suspect on a series of false assumptions of inherent dangers arising from protein intakes that are reasonable, not to say adequate. This seems obvious. Few of us, however, are free of dietary prejudice; and for the elderly especially (and some of the reasons I shall present) the idea is deep seated—"You dig your grave with your teeth"—therefore eat little of that for the mastication of which they were ideally devised.

Primitive peoples of all periods have attacked and dispatched flesh food with gusto whenever they found it. African elephant hunters describe the same sort of feasts that Stefansson encountered among the seal-eating Esquimaux. (Recall also the relish they have for the raw viscera with their vitamin stores.) Somewhere, however, within the maze of medieval contrasts between gluttony and asceticism there arose antagonism toward the flesh meat. Religions, both Oriental and Occidental, found outlets for hygienic and spiritual guidance in restrictions, limitations and fastings in which the "flesh pots" attained conspicuous condemnation. The cost of meat and the difficulty of its preservation entered in and helped engender the class struggles still so much a part of life. I wish to make it clear that these esthetic, economic and traditional factors affect the older age groups in much greater proportion than the young.

So much has been published about life expectancy extension along national lines, it occurs to me that local statistics bring the situation much closer to our consciousness. To accomplish that purpose I submit some statistics recently compiled by Duluth's Health Commissioner.* They tell their own story. While the very great saving of infants under one year is admittedly the greatest source of life extension, still the gains after forty-five and the survivals after seventy-five are striking. No one should be surprised by the accumulating interest in Townsend Clubs and adventures in security.

TABLE I. AGE AT DEATH STATISTICS
(Duluth, Minnesota)

	1900	1937
Average age at death (arithmetical)	26.79	58.65
Deaths at age—under 1 year	24%	5%
over 75 years	4%	25%
Those attaining 45 years or more	24%	79%

The much publicized increase in life expectancy in the United States from 1901 to 1936 is featured in Table II.

A balanced diet for normal individuals is surely comparable, in promoting efficiency, to that of "a sane mind in a sound body." Most people do not need to be urged to eat. We may indeed have an excess of Sancho Panzas with us. Suit-

*I am indebted to Health Commissioner Dr. Mario Fischer for these Duluth figures and statistics.

PROTEIN DIET FOR ELDERLY PEOPLE—TUOHY

TABLE II. INCREASE I— LIFE EXPECTANCY*
(1901 to 1936)

Year	Expectancy at Birth Years
1936	60.81
1935	61.37
1934	60.79
1933	61.26
1932	61.07
1931	60.26
1929-1931	59.57
1919-1920	56.42
1910	51.49
1901	49.24

able nutritive elements for the human gastrointestinal system are as important as a properly adjusted octane content gasoline is for a motor and its carburetor. When special emphasis is placed upon protein it is not an assumption that other necessary food elements are to be despised. This statement stems from the tendency of many people to develop their food habits with not only religious tradition but fervor as well. In other words, it is a highly personal matter conditioned by all sorts of circumstances including fads, fashions, and hunches, based on suppositions, someone's say-so, or confusions engendered by familial, social, environmental and personality quirks. The prejudice against protein has been considerable. As people grow older, age and the battle of life bequeath body squeaks, even as they come to used cars. To these weaknesses of the flesh is all too often added economic dependence. The obsolescence of skills and employment are the unhappy by-products of attempts at security which stand in the way of continued employment for the old. Consorts die and previously self-sufficient contented households are broken up. The "bachelor scurvy" so vividly described by Castle arises from the lack of incentive to prepare food for those eating alone or from fantastic choosing on the part of widowers, for example, long accustomed to conscientious safeguarding by their consorts. It is in this inelastic period of life people are prone to dump the blame upon something they ate. The salutation, "How's your liver?" of older times (likely an outgrowth of the era of humors) expressed a fundamental and physiologically sound approach to a good health appraisal.

*Excerpted in part from Harwood, Murray P.: *An Evaluation of the Factors for Public Health Progress in the United States*. Science, 89:517, (June 9) 1939.

Therefore, I turn to current research on liver function to help establish the principle of a higher protein bodily need than is usually considered.

The epochal work of Mann and Bollman and their co-workers on the protective values of food-stuffs in the matter of limiting hepatic lipid has focused our attention upon carbohydrates to sustain and prolong life in the presence of a severely damaged liver. This teaching has greatly influenced surgical and medical therapeutics. At the same time it is possible that it has more or less submerged the equally obvious circumstance that protein protects the normal liver. Time does not permit going into this in further detail except to point out the excellent experimental work with chloroform inhalation on animals made by Goldschmidt, Vars and Ravdin.⁴ These observers agreed with Mann and Bollman in according protective value to those foodstuffs which limit the deposit of liver fat. They point out that it is not true that protein is all immediately utilized unless fixed in living tissue. They give argument substantiating some degree of protein liver storage. They state that some of the carbohydrate protection afforded the liver comes indirectly through sparing protein for its more vital purpose. The essential point involved seems to be that protein is needed for the building of new body tissue, regardless of how the protein is spared or utilized. The basic need of protein is admitted. It is largely a question of how much.

The damage to hepatic cells after one hour's chloroform anesthesia increases progressively and decisively as lipid concentration in the liver increases. A high concentration of glycogen by itself did not seem to protect the liver of rats against the hepatotoxic action of chloroform. In general rats with high protein diet stood a lot more chloroform with less liver necrosis than those with depletion of protein stores after starvation. This is in a measure the story of alcohol and liver damage in the human.

The expression "living on the fat of the land" describes that finish and gloss (whether applied to man or beast) which properly acclaims and establishes the needful fat requirement. Burr² recently gave before the program at the University of Minnesota Fiftieth Anniversary Meeting a summary dealing especially with the highly essential fatty acids. On the same program Whip-

ple,⁸ of erythropoietic development fame, spoke upon the production, utilization, and significance of blood plasma. Not only did he mention the circumstance that the liver plays a very great part in the formation of plasma protein but pointed out that, in general, plant proteins are much less effective as a source than those coming from animal tissue. This introduces to us the whole subject of what is and what is not "proper and adequate protein" with the need of studies distinguishing the amino acids and attempting to allocate their distinctive properties and functions. McLester⁶ quotes from the Harvey lecture by Rose, "twenty-one known amino acids in purified form—yet one more, threonine, was indispensable for growth." The specific action of these proteins, simple or combined amino acid complexes, seem to trek hand in hand with certain of the vitamins and all are tied up with that intricate mechanism of tissue cell respiration for the elucidation of which Warburg over a decade ago received the Nobel prize.

The situations involved in the studies of energy release at the level of the cell membranes is abstruse but intriguing. This involves some very intricate biochemistry. Clinical physiologists (as attested by many articles) are currently striving to suggest its practical application. The subject was recently summarized editorially in the *Journal of the American Medical Association*.⁹ The circumstance which should challenge our attention (and urge continued attempts at understanding the chemical physical processes involved) arises from the readily understandable fact that (unlike energy release at very high temperature and pressure levels in a motor or furnace) living tissues must effect such release at relatively low temperatures. Active agents, the reverse of chlorophyll in plants, which link up radiant energy with water and carbon dioxide for plant growth (and in turn becomes the food for animal growth), must unloose this energy to living cells. Numerous catalysts further oxidation first by delivering hydrogen (dehydrogenation) to "acceptors"; to be followed by oxidation through a great variety of systems in which enzymes and co-enzymes promote the reaction. Up to date a great deal of theory intervenes but we know without any theory that inert proteins become living protoplasm and selective action by body cells occurs according to Whipple without the necessity of entirely breaking down protein mole-

cule aggregations into their component amino acids.*

Endocrine products (internal vitamins) may not be left out of this complicated set-up, as is well illustrated by the action of insulin on glucose. Tuttle⁷ has recently stated the probable mechanism of interaction of the pituitary and suprarenal through central nervous linkage with the blood stream demands, generated by tissue cell needs. The feature I return to is the circumstance that physiologists place the essential process of "phosphorylation" (break-down of the molecule to a size such that normal osmotic pressures suffice for capillary membrane permeability) chiefly in the liver. After insulin accomplishes this transfer of glucose to glycogen it has no further part in the metabolism of glucose. Arterial blood is said to contain no insulin. Its reaction, therefore, terminates at least with the entrance of blood into the left heart. Another biochemical observation bears upon phosphorylation and the liver. Spies states that the substance cocarboxylase (now synthesized) is as effective as thiamin chloride and is the latter substance after phosphorylation. He suggested its use in the circumstance where liver function is so far reduced that (comparable to the ineffectiveness of Vitamin K in marked liver function depression) thiamin would be inactive. No doubt as knowledge advances many of these conclusions may suffer adaptation, withdrawal or limitation. Nevertheless, at this time, liver assemblage, reconstruction and storage, may not be over-emphasized. Since the deposit of lipid in the liver is for the most part unfortuitous, and available glycogen is largely expedient for rapid and immediate energy release, then it follows that protein sufficiency is paramount. When we add to this the intricate and intimate specific manner in which certain amino acids are linked with enzymes, co-enzymes, endocrine products and vitamins, we begin to appreciate the early work of Goldberger, who pioneered with a diet rich in lean meat for pellagra, long before Elvehjem isolated nicotinic acid. The intimate association of these necessary stabilizing and protective substances with protein cannot be accidental.

It is possible to assemble a surfeit of clinical

*Biochemists link together cytochrome, Warburg's yellow respiratory ferment (containing riboflavin from B₂) and glutathione as active acceptors. Ascorbic acid⁸ and glutathione are ranked as the most active reducing substances in living tissue. The former is found most abundantly where cell activity is intense (suprarenal).

evidence that low protein diet where it has been the traditional rule is either valueless or (what is more likely) baneful. High protein diets are now recommended in acute nephritis (McKhann) where it is necessary to offset urinary protein loss; hypertension is in no way inhibited by leaving out meat and many subjected thereto become tired and anemic; arthritics (whatever the cause) need upbuilding and while gout may call for dietary direction, it is by no means controlled by fasting; much abuse exists in the treatment of peptic ulcer and so-called colitis by pap diets; obstetricians know that pregnant women (so commonly anemic) need forcing of a full diet even if exhibiting signs of toxemia; the condition described by Wills among women in India is practically the same as that described by Alsted¹ as extrinsic pernicious anemia and due to low protein in the diet; protein deficiencies in idiopathic hypochromic anemia are usual, secondary to the anorexia of achlorhydria—in fact a meat diet stimulates hydrochloric acid output. After all these are summarized, we return to the plight confronting those who are growing old, and if we observe carefully we find among them instances of malnutrition. When appetite recedes from any cause meat or its equivalent is usually the first item left out. This comes from necessity when economic reverses come; but to many the reversal is in the province of the mind. Physicians have all too long been guilty of blanket injunctions as nebulous as the miasmas—"cut down your eating"—"secure a bland diet"—"take nothing but white meat."

We know the chief issue behind the avitaminoses is proper food. Fortification with vitamin concentrates (Elvjhem) may be indicated in some soil-impoverished areas, but certainly not in our glorious midcontinental alluvial treasure land. It is far more than a medical problem to effect such distribution as common sense dictates must ultimately obtain. But we must now retract in terms of the convincing output of nutritional research, and gradually antidote, the damage we have previously done by suggesting low meat diets. As far as mental inhibitions are

concerned, it should be helpful to recall that researchers in nutrition unanimously report that the rat instinctively seeks and eats what he needs if he is able to get at it. Instinct is too often repellant to humans and their great gift of consciousness is diverted to the support of cultism, faddishness and mimicry. Women have long been accused of partiality toward this very human propensity. No man who ever takes the time to peruse our hospital diet lists or read a book replete with dietary outlines would ever recognize in his sex any notable insulation toward the same tendencies. Every folly ever embodied into routine textbook fill-ins that supposedly outline dietary regimen in various disease states continues the incubus with each revision or translation.

There will be a tendency on the part of a few to reject this thesis. Some will confuse the urge to eat normally with justification of gluttony. Others may confuse the issue of obesity or its associates, diabetes and arteriosclerosis (so fearsome to insurance actuaries). But we may add, where shall we turn unless to adequate protein, to keep down weight, avoid overtaxing carbohydrate tolerance (Joslin), or (if you think O'Leary's lead is right) postpone lipid arterial infiltration. Certainly as the years extend and senescence arrives, proper guidance includes accommodating effort to capacity. That, with explicit application of the principles I have outlined, is the chief concern and purpose of geriatrics.

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While stomach lavage is not practical or even necessary for universal use, no patient with clinical signs of tuberculosis who has negative saliva should be considered negative for the disease until stomach lavage has yielded negative results. The absence of tubercle bacilli in only one stomach washing does not necessarily signify that the disease is arrested, especially when the collapsed lung is re-expanding. A. Stadnichenko, M.D., et al, *Jour. A.M.A.*, February, 1940.

GENITAL TUBERCULOSIS*

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PROGRESS in the early diagnosis and treatment of renal tuberculosis did not occur until urologists and phthisiologists, working together, began to study the disease—tuberculosis—which disclosed that lesions in the kidney are local manifestations of a generalized infection. During this study it became apparent that the route of spread of the infection from the chest cavity to other organs and tissues is lymphohematogenous. This means that all tissues or organs in the body may become infected with bacilli of tuberculosis when spread has occurred from the chest cavity. Local susceptibility, anatomical and developmental faults, the number of blood vessels in organs and tissues seem to be factors that determine which ones are most often infected.

A careful review of the literature and the data obtained from our clinical study of many patients reveals that the diagnosis and treatment of lesions of tuberculosis of the genital tract require the same understanding of the disease tuberculosis and the route of spread of infection as does tuberculosis of the kidney.

Route of Spread to the Genital Tract and the First Organs Involved

The route of invasion, the location of the first lesion, and the method of spread of bacilli of tuberculosis to and in the genital tract are etiological factors about which there is still no general agreement among urologists and phthisiologists. When evidence of spread from the chest cavity has occurred, we find that the kidneys will be involved in 4 per cent and the genital organs in .6 per cent.

How do bacilli of tuberculosis reach the organs and tissues in the genital tract? Some observers are quite sure that the only route of invasion is via the blood stream and that when this occurs the epididymi or the seminal vesicles are first involved. Others believe, including ourselves, that bacilli of tuberculosis present in the urine from a renal lesion may infect the prostate

gland via the mucosa of the posterior urethra and the prostatic ducts and from here spread to other genital organs. Some clinicians recognize the possibility of both routes of infection being operative when the genital organs are involved.

Moore,¹⁷ a pathologist from the New York Hospital, examined serial microscopic sections of certain areas of autopsy specimens of the prostate gland. Moore tried to determine the most frequent location of lesions of tuberculosis in the prostate gland and the anatomical relationship of the lesions to the duct openings, the blood vessels and the acini of the glands. Moore found the majority of microscopic lesions near the blood vessels, and at the periphery of the prostate gland, so that he states that the route of invasion is most often via the blood stream.

Data obtained during our clinical examinations of both normal and pathological tissues and organs removed by surgical operation or during autopsy do not agree with Moore's published opinions concerning the most frequent route of invasion of the prostate gland by bacilli of tuberculosis.

We are sure that an organ like the kidney or the prostate gland must be completely serially sectioned and all sections examined through the microscope before one can say that the organ does not contain a lesion of tuberculosis.

The statements made and the opinions expressed in this paper are based on: (1) the data obtained during repeated urological examinations and the clinical data in the records of many patients who had some lesion of genital tuberculosis and who were observed at Glen Lake Sanatorium; (2) the pathological study of tissues removed during surgical treatment and at autopsy; and (3) a study of the data obtained from the autopsy protocols of 17,777 consecutive autopsies done by members of the staff of the Department of Pathology of the University of Minnesota.

Glen Lake is a county tuberculosis sanatorium

*Thesis read before the Minnesota Academy of Medicine, November 8, 1939.

and has a bed capacity of about 700. All age groups and patients with all types of lesions of tuberculosis are admitted to this institution so that we have an opportunity to study and to observe the disease tuberculosis in all its forms.

The relationship of lesions that occur in the urogenital tract to other lesions of tuberculosis and methods of spread were studied in eighty-seven patients who had some lesion of genital tuberculosis and who could be followed for at least two years. Eighty-seven per cent of this group had demonstrable lesions of tuberculosis elsewhere, 78 per cent being in the lungs. Sixty-four of our cases were well enough so that they could be repeatedly examined over a period of at least two years. *Ninety-two per cent had evidence of a lesion or lesions of renal tuberculosis.* The diagnosis of the renal lesion was made following repeated guinea pig inoculations of the urine sediment obtained from both kidneys.

Thirty-eight of our cases were examined before we were aware that lesions of tuberculosis in the genital organs begin in the prostate gland and that they are secondary to hematogenous lesions in the kidney. Routine instrumental examinations of the prostatic urethra and the ducts of the prostate gland were not made at this time. Many of the patients in this group of cases had epididymectomies before coming to the sanatorium. Many had no urological examinations.

During the time that we have routinely examined the kidney for evidence of the primary urogenital lesion, and since we have searched for lesions in the prostate gland, we have not failed to find evidence of a tuberculous lesion in the prostate gland when other genital lesions are present.

The data obtained from examination of twenty-three autopsy specimens more accurately reveal the facts concerning the first lesion of tuberculosis in the genital tract. We found evidence of tuberculosis in every prostate gland removed from patients who had genital lesions of tuberculosis. The kidneys removed from these patients contained easily demonstrable lesions of tuberculosis in twenty-two instances.

When genital lesions of tuberculosis are found or are suspected, *the whole urogenital tract should be carefully examined.* Our routine urological examination for evidence of urogenital tuberculosis not only includes the examination of

the kidneys but the genital organs and tissues as well. The utriculus, prostatic urethra and ducts of the prostate gland are always carefully examined through the endoscope or cystoscope. We have found evidence of infection in the prostate gland, *i.e.*, large duct openings and cavities, when the patient had no urinary symptoms or clinical findings suggesting lesions in this anatomical area. We believe that the prostate gland can be infected without the infection spreading from this organ into the vas, epididymis, or the seminal vesicle. We have examined many patients in whom evidence of tuberculous infection of the prostate gland could be demonstrated when the palpating finger introduced into the rectum did not find irregularities, nodules or firmness. In some instances we have found the size and extent of lesions in the prostate gland to be out of all proportion to a small lesion that may be found in the kidney. Our clinical data, obtained during careful repeated urological examinations of many patients with lesions of urogenital tuberculosis, disclose that the prostate gland is the first organ of the genital tract invaded with bacilli of tuberculosis.

One of us (Stebbins)¹⁸ recently examined the autopsy protocols of 17,777 consecutive autopsies done by members of the Department of Pathology of the University of Minnesota. In this group Stebbins found 1,283 cases having some gross evidence of infection with the bacillus of tuberculosis. Two hundred of these cases had some lesions of urogenital tuberculosis. Forty-five had lesions in the prostate gland, forty in the urinary bladder, twenty-three in the testes, sixteen in the epididymi, and fourteen cases in the seminal vesicles. Stebbins found thirteen instances of associated lesions in the epididymi and the prostate gland, and only three cases of tuberculosis of the epididymis not associated with infection in the prostate gland. Only four of the fourteen cases of tuberculosis of the seminal vesicles had no gross evidence of lesions of tuberculosis in the prostate gland. Most of these diagnoses were made following inspection of the gross specimen; some by microscopic examination of tissue removed from suspicious areas. The data from the examinations here quoted might have been different had serial microscopic studies been made of the whole organ. We believe that if this could be done, all patients with lesions of genital tuberculosis would have

an active focus or at least some evidence of an old lesion in the prostate gland.

Fenwick,¹¹ who reported data from 157 autopsies, found 3 per cent of urogenital lesions of tuberculosis in the prostate gland alone, 24 per cent in the prostate gland and epididymis, 3 per cent in the prostate gland and vesicle alone, and 6 per cent in the prostate gland and bladder.

In 1903, Hanson¹² produced tuberculosis of the epididymis and the testicle of rabbits by injecting bacilli of tuberculosis into the vas deferens. He found tuberculosis of the bladder almost always associated with tuberculosis of the utricule and the prostate gland.

Barney and Cabot⁷ reported data from 101 cases of urogenital tuberculosis and found the prostate gland involved in 75 per cent.

Collinet⁹ found the kidneys and prostate gland the urogenital organs most often infected with bacilli of tuberculosis. These may be the only urogenital organs involved.

Howard Jeck¹⁴ of New York, reporting from the Bellevue Hospital, found genital lesions present in a large percentage of cases of renal tuberculosis. Jeck's opinion is that lesions of genital tuberculosis always suggest the presence of renal infection. The examination of the genital organs during four autopsies which Jeck made upon patients who had renal tuberculosis disclosed lesions in the prostate gland in three.

Menville and Priestly¹⁶ of the Mayo Clinic recently published the data obtained from their pathological study of prostate glands removed from patients who had died of some lesion of tuberculosis. The prostate gland was, because of its close proximity to the urinary tract, the first and most frequent genital organ involved. Early small lesions of tuberculosis were very hard to find in the prostate gland. By direct extension these may involve the epididymis or other genital organs. These writers report that the epididymis, the testicle and the seminal vesicle may, at times, be the primary seat of genital infection with the bacillus of tuberculosis. In their opinion these lesions are blood-borne although Menville has reported that lesions of renal tuberculosis were associated with genital lesions in 74.2 per cent of his cases that did not include miliary infections.

Wells¹⁹ found tuberculosis of the epididymis invariably secondary to lesions of tuberculosis in the kidney. This writer did not mention the

prostate gland as probably the first genital organ involved.

Some writers have reported *primary lesions of tuberculosis* in the genital organs. We have never encountered one during many years of experience. Primary lesions of tuberculosis in the chest cavity may be minimal, may not produce local symptoms, and lesions that occur elsewhere following spread may be gross lesions which produce many symptoms. Lesions in the kidney that eventually produce metastatic lesions in the genital tract may be minimal ones. The bladder infection, if present, may produce no symptoms and cystoscopic examination may not reveal much evidence of a secondary cystitis, but the prostate gland may become infected and the epididymis may reveal evidence of secondary lesions.

Route and Method of Spread in the Genital Tract

We believe that the mucosa of the prostatic urethra, the ducts of the prostate gland and their openings, and the ejaculatory ducts and their openings may become infected with bacilli of tuberculosis that are present in the urine.

Spread may occur by direct extension along the mucosa of the ampulla into the seminal vesicle and along the vas into one or both epididymi. Clinical reports show that bilateral epididymitis occurs in 60 to 75 per cent. We believe that this large percentage of bilateral infection in the epididymis occurs because the utriculus may be frequently reinfected by chronic lesions in the substance of the prostate gland and its duct. Lesions in the seminal vesicle may occur with none (rarely) or only minimal lesions in the prostate gland.

Diagnosis of Lesions of Tuberculosis of the Genital Tract

The diagnosis of lesions of tuberculosis in the genital tract may be very difficult. Lesions may be present in the prostate gland and seminal vesicles without producing urinary or other symptoms noticeable to the patient. Rectal palpation may not reveal nodules, induration or infected areas. Acute lesions of tuberculosis of the seminal vesicles are reported. I cannot remember one such case in over eighteen years of study of urogenital tuberculosis. In association with tuberculosis of the prostate gland I find

tuberculosis of the seminal vessels occasionally but not as frequently as has been reported in the literature. It is difficult to make a positive diagnosis of tuberculosis of the seminal vesicles except when a firm indurated organ may be palpated and when the examination of the expressed secretion reveals bacilli of tuberculosis.

We frequently find evidence of tuberculous infection in the prostate gland with the cystoscope or urethroscope during routine examination of the whole urogenital tract. We may find large infected ducts of the prostate gland and small areas of necrosis surrounding the duct openings and in the substance of the gland from which pus exudes when pressure is made over this area. Nodules, irregularities, indurations and firmness found in the prostate gland with the palpating finger in a patient who has or who has had any lesion of tuberculosis, active or at the present time quiescent, should be considered a lesion or lesions of tuberculosis.

Tuberculous lesions in the epididymis produce swelling, tenderness, induration, irregularity in the contour of this organ and frequently a cord-like swelling and induration of the vas deferens. Subacute tuberculous inflammation may occur in the epididymis. This may be recognized clinically as a slightly swollen tender epididymis that is not nodular. Trauma frequently activates this subacute condition so that acute symptoms such as pain, swelling, high temperature and tenderness occur. This subacute condition in the epididymis is always associated with active infection in the prostate gland. This may be caused by the bacillus of tuberculosis or other bacteria and may go unnoticed if trauma had not been applied to the epididymis. Secondary infection may be present so that a differential diagnosis must be made. This is not difficult when any discharge from the urethra may be examined. If a lesion or lesions of tuberculosis are known to exist elsewhere in the body, the examiner must assume that those in the prostate gland and epididymis are tuberculous.

The first lesions of tuberculosis in the human body (except the bovine type, which is rapidly disappearing in this country) begin in the chest cavity, so that any lesions found elsewhere are metastatic ones and are evidence of a hematogenous spread from the chest cavity. However, lesions of tuberculosis in the epididymis are secondary to those in the prostate gland in

most instances, and the kidney contains the primary hematogenous lesion or lesions in the urogenital tract.

Treatment of Tuberculous Infection in the Genital Organs

Before treatment for lesions of tuberculosis in the genital tract is undertaken, the patient should be thoroughly examined for evidence of other lesions of active or quiescent tuberculosis. The urogenital tract should be thoroughly examined for evidence of lesions elsewhere in the genital tract and for the primary lesions in the kidneys. When the data obtained during these examinations are at hand the treatment of the genital lesions may be planned. When active lesions are found in the chest cavity or elsewhere, hygienic treatment only should be started. Most patients with any lesion of tuberculosis will gain if they are put at rest in bed. Heliotherapy may be used if this is indicated and if it is beneficial to the patient.

If a renal lesion is found this should receive appropriate treatment before treatment of the genital lesion is started. The surgical or other treatment of a renal lesion plus continued hygienic treatment after surgical operation will control and arrest lesions in the prostate gland.

Surgical extirpation of the prostate gland is never necessary.

Tuberculosis of the seminal vesicle will recover without surgical treatment if tuberculosis of the kidney is brought under control and hygienic treatment is practiced long enough. Lesions of tuberculosis in the epididymis should be treated actively, but surgical treatment is not always necessary. We have found continuous heat therapy locally, the surgical drainage of abscesses near the skin, and hygienic treatment satisfactory in most cases. The prolonged and continuous application of heat for long periods may be all the local treatment that is necessary. When other lesions of tuberculosis of the urogenital tract and elsewhere in the human body have been controlled and when local treatment of the epididymis has been unsuccessful, then we believe that surgical dissection and removal of the epididymis and the vas up to the internal ring should be practiced. We do not remove the testicle, and we are very careful to try to preserve the blood supply of this organ, although we are not always successful. The blood ves-

sels of the epididymis and the testicle anastomose freely. There are many different anatomical arrangements of the areas where anastomosis of these vessels occurs. When complete dissection and surgical removal of the epididymis and the vas is necessary, slough or atrophy of the testicle may occur, although careful protection of the vessels in the cord was practiced during surgical treatment. Inadvertently, the surgeon may remove all the blood vessels which supply the testicle when careful dissection is made and the epididymis is removed.

Following the surgical removal of the epididymis or any other organ containing a lesion of tuberculosis, the patient should remain in bed for at least three months at complete rest. This is advised so that active lesions which may have been undiscovered and others which may have been activated by the surgical trauma may again become inactive and quiescent.

Conclusions

1. Tuberculosis of the genital tract is a local manifestation of a general disease and lesions here are most often secondary to a primary urinary tract infection in the kidney. The treatment plan of the local genital lesion or lesions must be based on this pathological fact.

2. The route of spread from the kidney to the genital tract is most often via the urine.

3. The primary lesion in the genital tract is most often the prostate gland. From here the infection may spread to the other genital organs. Foci of tuberculosis in the prostate gland may produce no symptoms.

4. The seminal vesicle is infrequently infected with the bacilli of tuberculosis and is most always associated with lesions of tuberculosis in the prostate gland.

5. Tuberculosis infection in the epididymis is secondary in the genital tract to tuberculosis in the prostate gland. There may be a subacute stage of tuberculosis of the epididymis which is activated by trauma.

6. Treatment of lesions of tuberculosis in the genital tract consists of:

(a) The location and arrest of other lesions of tuberculosis and of the primary focus in the urinary tract by whatever means are necessary.

(b) Hygienic treatment of lesions of tuberculosis in the epididymis and heliotherapy to be followed by application of heat, incision and drainage, and surgical removal when indicated.

(c) Orchidectomy is rarely necessary.

(d) Hygienic treatment for tuberculosis of the prostate gland and seminal vesicles after removal or arrest of other active foci in the urogenital tract is always practiced. Surgical removal of these organs is seldom necessary.

(e) Postoperative rest for three months is always essential.

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TUBERCULOSIS IN THE AGED

It is known that when old people are found to have tuberculosis it is almost impossible to teach them to take care of themselves and protect others from infection. They will not cover their mouths during a cough or sneeze, nor will they try to protect or destroy their sputum. Their idea is that they have lived all these years with this old cough, it will not hurt them and they do not see how they can hurt anyone else. Elderly people with a chronic cough and positive sputum are a menace to society and should be isolated. C. L. Harrell, M.D., *Virginia Med. Monthly*, November, 1939.

SURGICAL DRAINAGE OF THE ABDOMEN*

A Review of Literature

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TAIT'S dictum of 1911, "When in doubt, drain," has been, for more than two decades, the guide of many surgeons, but drainage has been practiced since the time abdominal surgery began. References are made to it in the old Greek literature. Mikulicz, about 1860, first expressed the rather daring and bold opinion that a gangrenous appendix might be removed and the peritoneal cavity closed without a drain (Cafritz).⁶ Jennings¹⁰ says that drainage of the abdomen seems to have remained more a matter of empiricism than of reason. There has been more attention directed, of late years, to the possibility of non-drainage and in 1929 W. J. Mayo was led by his observations to make a dictum to the effect that "When in doubt, don't drain." Warbasse feels that Mayo's dictum is becoming more popular.

Types of Drains

There is a great diversity of opinion as to what type of drain is to be used if drainage is instituted.

Jennings¹⁰ states that the ideal drain would be one which produced no exudate and caused no damage by its presence, which absorbed and removed the fluid present or about to form immediately and which could be removed without trauma to the surrounding structures. It should be highly and durably capillary and must be completely sterilizable. At present, we have no drain approximating these requirements, but Jennings feels that raffia has possibilities for the future.

Arnheim and Neuhoft¹ feel that tube drainage should not be employed, for the following reasons:

1. There is no assurance that the tube remains where it is placed.
2. There is post-mortem evidence of residual abscesses about tube drains.
3. There is an irregular collapse of the walls of an abscess cavity or infected bed around

and beyond the tube with consequent tendency towards pocketing.

4. With drainage tubes, foul discharge and sloughing are commonly noted postoperatively.

They consider perfunctory gauze drainage in the same category as tubes, but add that gauze drainage is correct only if the infected area or areas are packed openly from the bottom. They seem to follow Tait but they use strips of iodoform gauze which are packed into all the recesses of the cavity or cavities or in non-abscess cases if appreciable purulent exudate exists or when the appendix or diseased viscus has been attached to an obviously infected bed. Drains are not disturbed until loosened by discharge, which they find is rarely profuse and rarely foul. The gradual shortening of the drain is begun usually about a week after the operation.

Spelman,²⁰ working with Hertzler, feels that rubber tubing drains delay formation of a thrombus in vessels while gauze may promote it. On the other hand, rubber tubing may cause rupture of blood vessels if it is allowed to come in contact with them over too long a period.

Tenopyr and Shafiroff²³ state that gauze is ideal for hemorrhagic abdominal areas where ligation is ineffective, but Shambaugh and Boggs²⁸ feel that exposed gauze should be avoided whenever possible. When the drain is for the control of bleeding and the hemostatic effect of the gauze is required, the cigaret type of drain should be employed and care be taken that only the gauze which is in direct contact with the bleeding tissue is left uncovered by the rubber casing.

Gauze packing like Mikulicz' drain or Joseph Price's cofferdam used in the pelvis for draining localized abscesses serves the purpose of draining but causes endless convalescence and dense and lasting adhesions (Ford Eastman).¹³

Chaffin⁸ feels that the only type of drainage of value is the capillary drainage, the value of which is only minimal and of short duration. He, therefore, believes that gravity or suction drainage alone is of value. Open tubes or drains

*Prize essay in contest open to Duluth internes and sponsored by the Duluth Surgical Society in 1938. Read before Duluth Surgical Society and at annual meeting of the Wabasha County Medical Society, Lake City, October 5, 1939.

afford outlet for much exudate under pressure but do not drain.

Summary.—At present, we have no ideal drain meeting the requirements of Jennings, chief of which are that the drain absorbs and removes the exudates well and does not produce damage to tissues.

Experimental Investigation of Drains

Several investigators have contributed much to the profession by their experimental studies on drainage.

Hertzler,¹⁸ in 1919, in his monograph on the peritoneum, described the changes occurring when the endothelium of the peritoneum is traumatized. He found, to begin with, that the endothelial cells are not easily removed for microscopic study and it is only when reactive processes are added to mechanical insults that the cells readily loosen. A great deal of energy must be applied to secure an abrasion by rubbing with a piece of gauze. Certainly, no manipulation with gauze within the range of operative technic is sufficient to dislodge the cells. Trauma, even to this extent, is not followed by reaction other than the formation of an exudate with prompt endothelialization. The bite of forceps and traction with sharp-pronged hooks are much more deleterious sources of trauma. With these instruments solution of continuity of the basement membrane may be produced which may be the source of permanent adhesions. A source of still more mischief is the ligation of pedicles, leaving an exposed stump which is capable of injuring normal surfaces with which it may come in contact. When the mechanical injury extends to a sufficient degree to cause death of tissue a reactive process follows. The dead tissue institutes the same sequence of symptoms that bacterial toxins produce.

When the processes of inflammation and wound healing coexist, the latter can become active only after the former has overcome the noxious agents. The tissues possess a certain capacity to prevent the growth and development of bacteria, but the conflict in the tissues may be so slight that it does not find expression in marked subjective or objective changes generally recognized as inflammation. The surgeon is apt to depend too much on the ability of the peritoneum to take care of a certain amount of infection because animal experimentation and clinical experience have shown that it is capable of do-

ing so. Did he realize that by just so much is final healing retarded he might manifest a greater reluctance in adding the additional burden. Devitalized tissue is as important as bacteria in producing minor disturbances in wound healing. There is no dividing line between the formation of fibrous tissues, the healing of wounds, and the formation of adhesions.

The rule is universal that what the peritoneum cannot absorb, it walls off or dies in the attempt. Any foreign body not capable of prompt absorption is walled off. Therefore, any foreign body placed in the peritoneal cavity to prevent adhesions must, most certainly, induce that which it was intended to prevent.

Yates,²⁰ in his Senn prize monograph of 1902, on abdominal drainage, conclusively demonstrated that drains do not drain after twenty-four hours.

In a series of dogs under sterile precautions, drains were inserted into one flank. The animals were allowed to recover and after stated time intervals incisions were made below the ensiform cartilage. The animals were placed in high Fowler's position and a solution of normal saline colored with carmine red was allowed to run in through the above opening. Control incisions were made in the opposite flank and a fresh drain was inserted at the time of the second procedure. In no case did the original drain discharge any of the injected colored fluid although there was always a flow from the new drain. Autopsy examination of the animals proved that the drains were completely walled off from the general peritoneal cavity, isolation of the drain occurring, usually, within four to six hours, being complete in twenty-four hours. It did not matter whether gauze, rubber, or a combination of both were used; the end-result was the same. The infected peritoneum preoperatively injected with virulent staphylococcus cultures reacted to foreign drainage in very much the same manner, but much more rapidly, in the process of encapsulation of the drain. Yates observed that animals with generalized peritonitis reacted to the presence of a drain by the severest type of inflammation. If these animals recovered, the areas encapsulating the drains consistently showed the invading organisms in the postoperative adhesions long after recovery occurred. Yates claimed that drainage for animals, suffering from generalized peritonitis, was more detrimental than beneficial.

Yates gives the necessary explanation for the profuse purulent discharge that soaks the gauze and is such a delight to the surgeon who believes he is actually removing toxic material from the cavity. The seropurulent discharge found on the dressing is in all cases a serous discharge, a part of the exudative phenomenon of the particular area of peritoneum irritated by a foreign substance (the drain) and contaminated by a foreign substance—as Councilman has shown by cocci that have travelled down the drain. This discharge will continue to flow as long as the drain remains in the cavity. Yates' graphic description of the gross and microscopic pathological changes that occur with peritoneal drainage follows:

"There is, at first, a serous exudate associated with local hyperemia. As the inflammatory reaction increases, a fibrinous exudate is formed and there is more intense local congestion and some edema. The serosa loses its luster and is finally covered with opaque fibrin. This fibrinous surface persists in the presence of smooth drains for at least seven days. Gauze drains, however, act differently. The fibrin becomes incorporated in the meshes, followed by an ingrowth of granulation tissue, so that when the gauze is removed, instead of leaving a smooth surface it is rough and bleeding, with fibrin and superficial tags of granulation tissue still clinging to portions of the gauze. The serous exudate is most abundant during the first few hours (four to six), when it becomes noticeably less in amount and concomitantly there begins the visible deposit of fibrin. This serous excess is manifested during this time by the wetting of the abdominal dressings and by the appearance of an increased amount of intraperitoneal fluid which disappears about the time of isolation of the drain by adhesions is affected. The character of the adhesions varies with the nature of the drain—the greater and more prolonged the irritation the more intense the reaction and the finer the adhesions. All serous surfaces, visceral or parietal, react similarly."

Any foreign body allowed to remain in the peritoneal cavity results in adhesions. Blood clots beneath the peritoneum undergo organization and produce adhesions.

Hertzler stated that if the edges of the peritoneum are carefully everted into the incisional wound at the time of closure, allowing only a small suture wound to present toward the peritoneal cavity, adhesions are prevented with a considerable degree of certainty. His observations are sufficient to demonstrate the importance of the cut edge of the peritoneum whether by the teeth of forceps or marked blunt trauma inflicted by retraction in inverting adhesions. All

that the surgeon can do to prevent adhesions is to operate with the utmost gentleness, placing the minimum of foreign bodies of all sorts, either temporary or permanent, within the abdominal cavity, and cover the denuded surface as carefully as possible.

Yates, in his conclusions, states that drainage of the general peritoneal cavity is both physically and physiologically impossible. He says that "peritoneal drainage must be local and unless there is something to be gained by rendering such an area extraperitoneal or by making such an area a safe path of least resistance leading outside the body, there is, aside from hemostasis, no justification for its use."

Indications for Drainage

Today, the main controversy is not how to drain but whether or not drainage is necessary, and if it is necessary, when it should be done. A general review of the literature on appendicitis reveals the fact that no amount of analysis allows for any dogmatic statements on the question of drainage. The great bulk of the literature on the drainage of the abdomen deals specifically with appendicitis. However, the general conclusions concerning drainage of diseases of the appendix will hold for many other diseases of the abdominal cavity. It is a generally accepted statement that drainage of the entire abdominal cavity is impossible and therefore of no value in peritonitis.

Richter²⁷ of New York and Hustinx (Willis and Mora)³⁰ of Netherlands feel that the presence of a serous or purulent fluid is not an indication for drainage, but rather the possibility of not being able to remove for one reason or another the entire source of infection.

Ford Eastman¹⁸ uses the indications of British Surgeons for draining: uncontrollable oozing, pyogenic membrane, or fecal fistula, present or imminent. Muelleder²⁴ of Germany adds the following to his list of definite indications: Children under ten years of age and patients over fifty years of age, when the intestinal coils are covered with much deposit and are agglutinated (pyogenic membrane), when the foul-smelling exudate is present in large amounts and when the pus from the pouch of Douglas, from the region of the liver, from the gastric gutter, or from the left side, flows toward the incisional wound. He therefore drains most of his cases.

It is the almost universal opinion of surgeons contributing to the literature, that a chronic localized abscess should be drained. For some, including Trinca,³⁴ Rhodes and Fernald,²⁰ and others, including Andrews, Miller, and Gatch as quoted by Rhodes and Fernald, a walled-off abscess is the lone indication for drainage. Straus and Tomarkin³² and Willis and Mora,³⁵ among others^{11,16} feel that a contaminated peritoneal cavity should be included with the chronic abscess for drainage indications. Arnheim and Neuhoof,¹ Gile and Bower,¹⁵ and others^{9,12,17,22,24} follow Tait's dictum of drainage when in doubt.

The rationale of draining is based on the prevalent, but probably erroneous, belief that though the absorption power of the peritoneum is, in comparison with other serous membranes, very great, the mechanical release through a drain of infectious substances is bound to speed up recovery and to facilitate healing (Cafritz).⁶

Weil says that "peritoneal exudation is evidently the sole means of defense possessed by the abdominal cavity." Murphy considers the removal of exudate from the abdominal cavity a great error, as the necessary defensive antibodies are also removed together with the exudate. He believes that the purulent exudations contain defensive elements and that the removal is harmful to the patient. Peterman agrees with Murphy's views as far as early exudates are concerned. He believes, however, that when the exudate becomes ichorous and purulent, and contains intestinal matter, necrotic tissues or other foreign matter, the exudate does more harm than good (Breitmann).²⁹

Bunch and Doughty⁵ concur in the belief that the inflammatory exudate so often found in the peritoneal cavity at operation is not protective and germicidal, but may be harmful and should always be removed.

Breitmann³ feels that in cases of peritonitis the water metabolism of the body is greatly disturbed by the loss of fluids which Rhodes and Fernald,²⁰ agreeing with Weil and Breitmann, believe contain the body defensive elements.

Grossan¹² favors drainage because he feels it relieves tension and protects against possible intestinal leak, but he urges caution in using drains because it must be remembered that a drain is an ordinary foreign body and must be placed in positions that are harmless to the tissues.

Summary.—Surgeons differ in their opinions

concerning the indications and necessities for drainage. Most surgeons probably feel much the same as Peterman in that early exudates are beneficial but that later exudates, ichorous and purulent, consisting of intestinal matter, necrotic tissue or other foreign material, are harmful and should be removed. All agree that a chronic localized abscess should be drained.

Factors Affecting Results in Analyses

Many articles in the literature on drainage and appendicitis were purposely free from any statistics because it was felt that there were too many factors involved in analyzing a series of cases, so that statistics on morbidity and mortality have little or no value.

Willis and Mora³⁵ and likewise Colt and Morrison¹⁰ feel that drainage has no effect upon the mortality rate but that the rate is more dependent upon the duration of symptoms before operation, the extent of the pathological changes, the virulence of the offending organisms and the resistance of the patient. It is interesting to note, however, that Colt and Morrison had a mortality rate distinctly lower in their series of non-drained cases.

Studying the relationship between the duration of symptoms and the mortality rate, Stanton³¹ has graphically shown that, in a compilation of cases from recent literature, after the attack has begun, the mortality rate of acute appendicitis varies greatly with the time that elapses before operation.

Day of Operation After Attack Began	No. of Cases	Deaths	Mortality Percentage
First day	1,507	20	1.3
Second day	912	33	3.6
Third day	663	56	8.9
Fourth day	365	46	12.9
Fifth day	442	49	11.6
Sixth day	346	29	8.4
Seventh, eighth, ninth days	178	5	2.8
Tenth day or later	288	7	2.4
Total	4,692	245	5.22

From these figures if the rule—operate before the third day or wait until after the sixth day from onset—were blindly followed, the mortality

rate would be cut in half. The mortality rate in most series of cases does not amount to more than 3 per cent.

Another factor in making the mortality rate in the drained cases seem higher than in the non-drained cases is that most surgeons drain the severest cases even when they treat the rest of their cases by non-drainage.

Kirtley and Daniel²¹ feel that the age of the patient is important in analyzing statistics. Their review of the literature showed a mortality rate in children under ten to be 23 per cent, and above the age of fifty years to be 15 per cent and rising with age. The mortality rates are lower in the age groups between these limits, being lowest in the age group of fifteen to twenty-five years, where it is 3 per cent.

Analysis of Methods and Results

Glasscock¹⁶ reported 457 non-drainage cases with one death due to bleeding from the slipping of a ligature on the mesoappendix. The drained cases had a mortality of 11 per cent, but he stated he generally drains the worst cases. McClure and Altemeier²² also had a mortality rate of about 11 per cent in their series of 252 consecutive cases of acute perforated appendicitis with peritonitis. All of their cases were drained.

All surgeons contributing to the literature agreed that a chronic localized abscess should be drained. Extraperitoneal drainage apparently gave the best results. Shambaugh and Boggs⁶ use a simple rubber tube to produce a sinus tract through which an underlying abscess may later be evacuated extraperitoneally. The drain is usually removed the fourth or fifth day and the abscess ruptured through the resulting sinus tract. When they insert a drain into the infected peritoneum in which one suspects that an abscess would form if drainage were omitted, the drain is not removed before the fourth day or before a structural tract is formed. Drainage of cul-de-sac abscesses per rectum is condemned. Most surgeons treating an abscess remove the pus by aspiration and sponge, dissect out and remove the appendix and source of infection if possible, insert drains and close up the abdomen.

Breitmann⁸ inserts one drainage tube between the omentum and the abdominal wall and feels he accomplishes as much as if he inserted a tube into the pouch of Douglas. The tube is removed the fifth to the seventh day. He states, however, that he does not circumvent the formation of ad-

hesions. Buchbinder⁴ agrees with Breitmann and follows the same procedure.

Newell²⁵ tried to treat all his cases alike with the same indications. He had fifty-six cases, twenty-three of which were not drained. There were no deaths in this group not drained, although there were eight deaths in the thirty-three drained cases.

Herrick¹⁷ treated 217 cases of acute appendicitis with peritonitis by immediate surgery and drainage. In his series he had five deaths—a mortality of 1.84 per cent.

Jones²⁰ treats his cases by appendicostomy with a catheter inserted into the appendiceal stump. Nourishments are given through the catheter and nothing per os for as long as perhaps five days. The suture through the skin and the tube is usually removed about the sixth or seventh day, and the tube is permitted to come out spontaneously. No fecal fistulæ have ever developed. He maintains normal physiology is more closely approached than by any other method employed. In a series of seventy-five cases he had a mortality of but 1.4 per cent. He reports that Wilkie of Edinburgh and Gatch have had similar experiences employing this method.

Cafritz⁶ referred to Marchini of Italy for figures on drainage and peritonitis. In this series of 301 cases of localized peritonitis, 184 were drained. There were nine deaths, a mortality rate of 4.88 per cent. One hundred and seventeen cases were not drained, with two deaths, a mortality percentage of 1.71. One hundred and one of the 142 cases of diffuse peritonitis were drained. There were thirty-one deaths, a mortality percentage of 30.69. Seven deaths, a mortality rate of 17.07 per cent, occurred in the forty-one non-drained cases of diffuse peritonitis.

One of the most interesting contributions to the subject of appendicitis and drainage was made by Cayford⁷ in his review of 614 cases seen at the Montreal General Hospital during the years 1931-1933. The average duration of illness prior to operation was 2.1 days. The patients averaged 15.99 days in the hospital. There were twenty-one deaths, a mortality percentage of 3.42. The patients were divided into three groups.

It will be observed that in Group B the drained group had a hospital stay of about seven days more than the non-drained group and the mortality percentage is about three times as great.

SURGICAL DRAINAGE OF THE ABDOMEN—GLABE

GROUP A. Acute diffuse or acute suppurative appendicitis, in which little or no inflammatory process extended to the surrounding tissues. No drainage.

Number of cases.....	266
Average days in hospital.....	11.34
Wound infections.....	2
Death	1

The fatal case was that of a female, aged 28, who had suffered from general debility associated with long-standing kidney disease. She died on the thirteenth day after operation with acute gangrenous cystitis with uremia.

GROUP B. Spreading or diffuse peritonitis was present. In each case free fluid or free pus was found at operation. In each there was a pathological report of acute suppurative, acute gangrenous, or acute perforative appendicitis.

Number of cases.....	265
With drainage	
Number of cases.....	111
Average days in hospital.....	21.42
Deaths (9.01%).....	10
Complications	
Wound infections.....	5
Fecal fistulae.....	2
Residual abscess.....	2
Deaths: Generalized peritonitis usually uncomplicated.	
Without drainage	
Number of cases.....	154
Average days in hospital.....	13.41
Deaths (3.24%).....	5
Complications	
Wound infections.....	12
Residual abscesses.....	3
Deaths: Four due to general peritonitis and one due to cellulitis extending from the incisional wound.	

GROUP C. Acute appendicitis with localized abscess. In the drained cases the abscess cavity was evacuated by suction and moist gauze, and the abdomen closed with the application of liquid paraffin.

With drainage	
Number of cases.....	54
Average days in hospital.....	24.33
Deaths (1.85%).....	1
Complications	
Wound infections.....	5
Secondary abscesses.....	2
Death: A man, aged 37, who died the sixth day postoperatively with paralytic ileus complicated by bronchopneumonia.	
Without drainage	
Number of cases.....	21
Average days in hospital.....	22.9
Deaths	0
Complications	
Wound infections.....	2

There is very little difference in the figures covering the group of cases of acute appendicitis with localized abscess except that complications were more common in the drained group and there was one death.

Summary.—The mortality rate in most series of appendicitis cases drained or undrained usually is about 3 per cent, while the rate is about 11 per cent in the drained cases. Many factors enter into deductions made from analyses of series but cases treated by non-drainage seem to have lower morbidity and mortality rates. Much may depend upon the surgeon alone.

Complications of Drainage

Tenopyr and Shafiroff²³ state in answer to the question of the dangers following drainage in patients who recover, that the incidence of intestinal obstruction, herniation, adhesions and fistula formation is very much the penalty for the use of drains.

Mensing,²³ Sperling and Wangenstein,³⁰ and others^{2,6,7,13,14,19,24,25,26,29,32,35} also feel that the insertion of drains leads to more complications and longer convalescences than non-drainage.

Ford Eastman¹³ feels that incisional hernias are due to cellulitis slough of important abdominal fascia and to muscular atrophy from disuse dependent upon long suppuration.

Breitmann³ considers it very erroneous to apply drainage and tampons at the spot of intestinal sutures because of the danger of fistula formation, or in proximity of blood vessels, as there is danger of necrosis of the walls, leading to bleeding. Proximity of drainage tubes to the walls of the intestines may cause perforation.

Mueller²⁴ says that abscess formation cannot always be avoided by the insertion of a drainage tube into the pouch of Douglas. He is certain that primary closure of the abdominal wall is well suited to make the disease picture milder, as well as to shorten the duration of healing.

Bancroft² obtained results as shown in the accompanying table, in comparing the complications in eighty-seven drained and eighty-seven non-drained cases.

Glascock¹⁶ noted that 50 per cent of his ruptured non-drained cases presented wound infections and he expressed the opinion that it might be advisable to drain the wound down to the peritoneum. Every drained case left the hospital with a discharging wound. In the non-drained

SURGICAL DRAINAGE OF THE ABDOMEN—GLABE

	Drained		Not drained	
	No.	Per cent	No.	Per cent
Infected wounds	12	10.5	3	2.6
Hematomata	2	1.6	9	7.8
Secondary abdominal abscesses	5	4.6	1	0.8
Intestinal obstruction	1	0.8	1	0.8
Paralytic ileus	2	1.6	0	0.0
Fecal fistula	3	2.6	0	0.0

ruptured group, when no infection occurred, the patient's temperature became normal on the third or fourth day, as compared with the twelfth or thirteenth day for the group that was drained. He considered this to be an accurate indication of the ability of the peritoneum to take care of itself after the source of infection had been removed and felt it supplied further evidence that the drain acts as an offending agent. In his series, the earlier the drain was removed the more readily the temperature returned to normal. The cases which were drained had a hospital stay of about four and one-half days longer than the non-drained cases. Although no fecal fistulae developed in the non-drained group, four occurred in the drained series, three of them in the gangrenous non-ruptured cases. He felt that this latter type of patient should be treated as a simple acute appendicitis not necessitating drainage.

Straus and Tomarkin³² studied 1,325 consecutive cases of acute appendicitis in relationship to

drainage. Their cases were treated in three different ways—abdominal drainage, subfascial drainage, and non-drainage. The non-drained group had an average hospital stay much shorter than the drained groups.

Non-drainage group	10.7 days
Subfascial drainage group	15.3 days
Abdominal drainage group	15.6 days

Probably delayed healing of the abdominal walls was the only factor in prolonging hospitalization. Of the 1,325 cases, 462 had abdominal drainage, 794 no drainage and 69 had subfascial drainage—863 cases, therefore, in which there was no abdominal drainage. The mortality rate of the abdominally drained group was 8.03 per cent in comparison to 2.21 per cent in the non-drained group. They realized that their more severe cases were drained.

There were 187 patients with ruptured appendices, twenty of whom died. Of the 187, 110 were drained intra-abdominally. Sixteen deaths occurred in this group, a mortality percentage of 14.5. Twenty-five cases were drained subfascially and fifty-two had no drainage—a total of seventy-seven without peritoneal drainage. The four deaths made the mortality percentage 5.2. Thirty-one of the 187 patients had drainage alone at operation. Six of these patients, or 19.3 per cent, died. The average duration of symptoms before operation was 7.9 days.

The following summarizes the complications:

	Abdomen drained		Abdomen not drained			
	No.	Per cent	Total No. Per cent	No drainage No. Per cent	Subfascial Drainage No. Per cent	
Pelvic abscess	33	7.1	21 2.4	10 1.2	11 15.9	
Wound infection	462	100.	197 22.8	128 16.18	69 100.	
Fecal fistula	16	3.4	5 .57	4 .5	1 1.4	
Intestinal obstruction	4	.86	2 .2	2 .25	0	
Paralytic ileus	5	1.08	4 .46	3 .38	1 1.4	
Generalized peritonitis	5	1.08	11 1.2	11 1.38	0	
Lobar pneumonia	10	2.1	6 .6	6 .7	0	
Bronchopneumonia	15	3.2	8 .9	8 1.0	0	
Embolic death	2	.43	0	0	0	

They stated that every drained case might be considered a wound infection.

Exclusive of wound infections, there were 139 cases, or 30 per cent, complications in the drained group, while there were 108 in the non-drained group, or 12.5 per cent.

Summary.—Statistics such as those contributed by Bancroft, Cayford, Straus, and Tomarkin, and Glascock reveal the danger of drains in themselves because of their foreign body effects. These dangers or complications include possible intestinal obstruction, herniation, adhesions, fistula formation, rupture of blood vessels, embolism, infected wounds, secondary abscesses, paralytic ileus and pneumonia.

Summary

1. At present there is not an ideal drain available. Most drains do not well remove or absorb exudates and most are likely to produce damage to adjacent tissues.

2. Yates and Hertzler especially have experimentally shown the processes developing and ensuing after the insertion of drains or foreign bodies into the abdominal cavity. Drains are quite ineffective after four or six hours and are completely walled off in twenty-four hours.

3. Surgeons differ greatly as to their opinions regarding indications and necessities for drainage. All agree, however, that a chronic localized abscess necessitates drainage.

4. Factors such as duration of symptoms before operation, the virulence of the organisms, resistance of the patient, age of the patient, and the tendency of surgeons to drain their severest cases forbid making any dogmatic statements regarding drainage or non-drainage.

5. With cases controlled as well as possible, non-drained cases seem to have lower morbidity and mortality rates than drained cases.

6. What are probable complications of drainage is the greatest argument against the use of drains.

Conclusions

The literature is full of contradicting articles on the subject of drainage of the abdominal cavity, especially in relationship to appendicitis, probably because there are so many factors influencing any study restricted to this one aspect, but after reviewing the literature it seems that a diversion from Tait's dictum to that of Mayo's

"When in doubt, don't drain" is quite imperative. Probably two unbiased conclusions may be drawn:

1. Drainage is perhaps indicated in chronic localized abscess alone.

2. Primary closure of the abdomen makes the disease picture milder, as well as shortens the duration of convalescence.

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MANAGEMENT OF ACUTE ABDOMINAL EMERGENCIES*

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THE surgical treatment of acute abdominal emergencies is, without question, the most interesting and fascinating field in which the general surgeon may delve. For its proper execution the surgeon is required to have not only technical skill, but also mature judgment coupled with a background of conservatism. Surely we cannot all hope to be blessed with all three of these attributes, but it is very easy for all of us to assume the last, namely, conservatism. In dealing with these emergencies, we should remember first and foremost that we are usually conducting a lifesaving operation and that the emphasis should be on this rather than on those factors associated with elective operation. Thus, the prime motive of the operation is to save the patient's life and the operation should be so conducted that this end is achieved. After the emergency situation has been controlled by a conservative procedure, one can direct his attention to the diseased organ and, if necessary, a second operation correcting the pathologic condition can be performed with a greatly decreased risk over attempting to cope with both at the same time. Such an attitude of conservatism can do much toward lowering the mortality accompanying acute abdominal operation. In this paper I shall discuss the surgical treatment of five of the more common acute surgical conditions arising in the abdomen.

Acutely Perforated Peptic Ulcer

The results at The Mayo Clinic and elsewhere definitely bear out the advisability of conservative surgical procedures in the management of acutely perforated peptic ulcer. The more radical procedures, such as gastro-enterostomy, pyloroplasty or resection, are accompanied by twice the mortality of simple closure followed by reinforcement of the region with omentum, which is, as a rule, the advisable procedure. In the

presence of marked scarring and a history of pyloric obstruction, if the perforation is of short duration and the patient's condition warrants a more lengthy procedure, gastro-enterostomy, pyloroplasty or gastroduodenostomy may be considered. Because of the marked inflammation usually present, any local procedure other than closure will be difficult technically. It is well to remember that few of these patients have had adequate medical management prior to perforation. Before subjecting them to the increased hazard of a long surgical procedure with the attendant danger of shock, a fair trial of conservative treatment seems judicious. Guthrie and Sharer have shown that simple closure of the ulcer results in 80 per cent cures and in only 20 per cent was there a recurrence of symptoms.

The anesthetic of choice is a combination of gas and ether. Because of the marked abdominal rigidity, relaxation is usually difficult and will require considerable ether to attain it. Spinal anesthesia is contraindicated because these patients are frequently in shock.

Most often the perforation will be easily discernible on the anterior wall of the first portion of the duodenum near the superior border. The sutures should be placed in the long axis of the duodenum so that when they are tied they will not tend to constrict the lumen. If the opening is too friable to close satisfactorily, the omentum or round ligament may be sutured over the area. One should always be on the lookout for multiple perforations.

If the perforation is closed within six or eight hours, probably in most instances drainage of the peritoneal cavity is not necessary if care is taken to evacuate the accumulated fluid with the mechanical sucker at the time of operation. If there is considerable fluid present or the perforation is of long duration, it is probably safer to drain, not only subhepatically, but also supra-

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pubically. I have never seen any ill effects following the use of the soft Penrose type of drain.

If the patient is first seen by the surgeon twenty-four hours or more after the onset and there is a tendency toward localization of the process, the best treatment may be conservative with the continuous nasal suction tube in the stomach. Under these circumstances operative interference might only add insult to injury by breaking open a closure which nature had already well effected.

Perforating malignant gastric lesions are occasionally encountered. Because of their nature, simple closure is technically impossible and resection is necessary with attendant high mortality. If perforation complicates malignant gastric lesions, it is usually subacute. If the condition is recognized it is best treated conservatively. Resection should be undertaken after the acute phase has subsided.

The mortality accompanying perforated peptic ulcer is in direct proportion to the time elapsed before surgical closure and to the magnitude of the operative procedure.

Acute Cholecystitis

At present there is considerable controversy over the management of the acutely inflamed gallbladder, some advocating immediate operation, others conservative treatment during the acute attack followed by operation after the acute symptoms have subsided. A few years ago only an occasional patient with clinically acute cholecystitis was operated on at The Mayo Clinic. Now, probably 50 per cent of the patients entering the hospitals as emergencies with a diagnosis of acute cholecystitis are operated on during the acute phase. The proponents of early operation advocate it for the following reasons:

1. Technically, it is easier because fibrinous adhesions are encountered rather than fibrous which are the rule later.
2. It does away with the danger of perforation into the stomach or duodenum or general peritoneal cavity with generalized peritonitis.
3. There is a lower mortality or morbidity.

On the other hand, the opponents of early operation give the following reasons for their attitude:

1. Technically, early operation is more difficult because of edema and bleeding. For this reason the common duct will be more frequently

injured and many patients will be subjected to cholecystostomy whereas if operation were postponed cholecystectomy could be safely undertaken.

2. Pathologic conditions of the common duct will be more frequently overlooked in early operation, because, often, icterus cannot be detected when the patient is first examined. If icterus becomes evident after operation, the surgeon will be in a quandary as to whether there are common duct stones or injury.

3. Rarely does generalized peritonitis result from acute cholecystitis.

4. Conservative treatment results in lower mortality and morbidity.

Personally, I have been pursuing a middle-of-the-road policy and have tried to individualize the treatment of acute cholecystitis. Those patients with considerable elevation of the temperature and pulse rate, accompanied by pronounced local findings, have been operated on immediately and usually cholecystectomy has been performed without difficulty. Occasionally the operation was difficult and rarely cholecystostomy proved the operative procedure of choice. On the other hand, the milder forms of cholecystitis have been treated conservatively during the acute attack and operated on in the interval at the patient's convenience. I am sure that the occasional operator will encounter more difficulty with early operation than later and, of necessity, will perform cholecystostomy where cholecystectomy could have been undertaken safely after the acute symptoms had subsided. In choosing between cholecystectomy and cholecystostomy, one should recall that the latter, more conservative procedure will relieve about 60 per cent of patients and only approximately 40 per cent will require further operation because of a recurrence of symptoms.

Acute and subacute pancreatitis are seen, usually accompanying acute cholecystitis. The milder forms can be diagnosed frequently by pain and tenderness in the left upper quadrant and by finding an elevated serum lipase. The more severe classic form is rarely diagnosed before exploration, because it is difficult to distinguish from the generalized peritonitis resulting from perforated peptic ulcer or a perforated appendix. If a definite preoperative diagnosis can be made, conservative treatment is in order, with explora-

tion of the gallbladder and ducts later, after the acute phase has subsided. If the diagnosis is made at exploration and the patient's condition is grave, drains should be placed down to the pancreas, getting out as quickly as possible. Of course, if the patient is in good condition, the needed corrective operation on the bile passages may be undertaken without undue risk. This will usually amount to exploration of the common duct with T tube drainage and cholecystostomy or cholecystectomy with adequate drainage over the region of the head of the pancreas.

Acute Intestinal Obstruction

When confronted with acute intestinal obstruction, one should determine first whether it is the large or the small intestine that is involved. Much abdominal distention with cramps and very little or no vomiting usually mean that the large intestine is involved; an annular carcinoma in the sigmoid is the most frequent cause. Often, conservative treatment, hot stupes to the abdomen and enemas in the knee-chest position, will be successful in relieving the acute phase of this type of obstruction. Duodenal drainage by means of the inlying nasal tube is rarely of any use in obstruction of the large intestine because the ileocecal valve permits very little fluid to back up through it into the ileum, even when the colon is much distended and there is considerable pressure in the cecum. Usually, one is safe in continuing conservative measures for twenty-four hours if the temperature and pulse are within normal limits. If there is no improvement at the end of this interval or if there is any tendency toward elevation of the pulse and temperature, one should undertake cecostomy immediately. This can be done satisfactorily under local anesthesia using a McBurney incision and the Witzel technic with a large No. 30 catheter. Exploration is not justified and a definite aseptic technic should be used, remembering that the fluid in the cecum is under terrific pressure. The patient will experience immediate relief and within twenty-four to forty-eight hours the abdomen is usually flat. It is not uncommon, after decompression has been effected, for the large bowel to regain its tonus and for the patient to empty his colon naturally. In ten days or so it is usually safe to attack the obstructing process directly.

On the other hand, if there is little distention with cramps and much vomiting, the small in-

testine is probably obstructed. The plain roentgenogram of the abdomen is of inestimable value, not only in helping to locate the obstruction in the large or small intestine by the pattern of the contained gas and fluid, but also in determining the efficiency of any type of therapy. For this reason, daily roentgenograms should be made. If the obstruction is of short duration with normal temperature and pulse and there is no evidence of strangulation as evidenced by rebound tenderness, one is justified in trying to decompress the intestine with duodenal drainage by means of the inlying nasal catheter.

If there is no definite improvement within twenty-four hours as evidenced by both roentgenographic and physical examination, or if there is a rise in temperature or pulse rate or a suspicion of strangulation, exploration should be undertaken without hesitation. On opening the peritoneal cavity, serous fluid usually escapes and if it is serosanguineous, one should look out for strangulation. In any acute obstruction involving the small intestine, unless it is known to be of an inflammatory nature, I believe that gentle exploration is advisable to rule out definitely strangulation or a closed loop type of obstruction. If an adhesion is found to be the cause, this may be severed and usually a Witzel type of enterostomy is advisable in the dilated intestine above the obstruction. A No. 16 or 18 catheter is large enough. If a strangulated loop is found and the patient's condition is good, one may proceed with resection and immediate anastomosis with temporary enterostomy above the anastomosis. On the other hand, if the patient's condition is critical, one should be satisfied with enterostomy and exteriorization of the strangulated loop, re-establishing the intestinal continuity later when the patient's condition has improved.

Adynamic ileus is characterized by marked distention, vomiting and absence of both peristalsis and cramps. This type is most often seen post-operatively. It is in this type of disorder, as well as obstruction of the small intestine due to inflammatory processes, peritonitis, and so forth, that the various forms of nasal tube decompression have proved successful in my experience. Rarely will duodenal drainage or the Miller-Abbott tube aid in relieving obstructions of the large bowel. Wangenstein, in popularizing duodenal drainage, pointed out its indications and contraindications, but in the enthusiasm for it

there has been a tendency to use it blindly in all obstructions and to rely on it too long before intervening surgically. In dealing with any type of intestinal obstruction the administration of barium by mouth is contraindicated and a dangerous practice. Transfusions and fluids by vein are frequently lifesaving measures in intestinal obstruction.

Strangulated Hernia

The mortality accompanying repair of strangulated hernia is in the neighborhood of 10 per cent as compared with 0.3 per cent in uncomplicated cases of inguinal hernia (latter figure from The Mayo Clinic during 1937 and 1938). Thus, the best treatment for strangulated hernia is prophylactic and for this reason one should not hesitate to advise early repair of all hernias, no matter how insignificant they may seem at the time of examination, provided that the patient is a reasonable operative risk. In dealing with strangulated hernia, the prime motive of the operation is to relieve the intestinal obstruction and to determine the viability of the strangulated loop. Repair of the hernia is of secondary importance and one should not jeopardize the patient's chance of recovery by prolonging the procedure until a satisfactory closure is effected. If the patient is in a grave condition and has a gangrenous loop of intestine, operation should consist only in the exteriorization of the involved portion of the intestine, thus allowing drainage and relief of the obstruction. At a later date, intestinal continuity may be re-established when the patient's condition is improved and the hernia may be repaired without undue risk.

Appendicitis

There is no question about the proper treatment of early acute appendicitis prior to perforation, but there is a great deal of controversy as to the proper procedure in the face of perforation and its complications. If signs of localization are not present in the face of a perforated appendix with generalized peritonitis, I feel the proper procedure is immediate operation with drainage of the peritoneal cavity. If the patient's condition warrants appendectomy and if it can be accomplished without trauma or spread of infection owing to the breaking down of protective adhesions, appendectomy is permissible. Rarely, a patient will be admitted in such poor condition that any operative procedure

would be attended by great risk. Under these circumstances, conservative treatment is indicated during which an attempt is made to rehabilitate the patient and to determine what method of management will be best for that type of case.

If, on the other hand, there are signs of localization of the inflammatory process, conservative treatment is instituted under close observation until the seventh or eighth day after perforation at which time the patient has greatest immunity to the infection. At this time the abscess is drained unless, as will occasionally happen, there is resorption of the inflammatory mass. Again, in this case, an attempt should not be made to remove the appendix unless it is free in the abscess cavity and can be removed without breaking down protective adhesions. If appendectomy has not been accomplished, the patient is advised to return for it in two to three months, unless acute symptoms ensue during this period; if such occur, operation, of course, is undertaken immediately, to obviate the occurrence of a second perforation.

All patients with peritonitis, whether operated on or treated conservatively, are handled in essentially the same way. Nothing is administered by mouth until flatus is passing per rectum and distention is relieved. If there is vomiting, continuous duodenal drainage is instituted. Fluids are administered subcutaneously and by vein. Personally, I feel that small transfusions of 250 to 300 c.c. of blood with oxygen therapy by mask or by tent, are the most potent weapons in treating peritonitis. Simple elevation by placing 10 inch blocks under the head of the patient's bed is just as efficient as the use of Fowler's springs, more comfortable for the patient and easier from the standpoint of nursing. Morphine is administered in adequate doses every three to four hours. Enemas and proctoclysis are avoided. A rectal tube is inserted for a few minutes every four hours. If abdominal distention is present, hot turpentine stupes are in order. Priestley^{4,5} has shown that Weinberg's serum is of definite aid in the treatment of peritonitis secondary to a perforated appendix.

The Use of the Sedimentation Rate in Diagnosis

The research that Bannick and his collaborators² undertook at The Mayo Clinic a few years ago in regard to the sedimentation rate of the

red blood cells in acute abdominal disease has done much toward clarifying the position that should be occupied by this valuable test in the differential diagnosis of acute abdominal conditions and has pointed the way to the prominent part this simple laboratory procedure will undoubtedly play in the future. Bannick found, after close observation in a number of cases in which the diagnosis was substantiated either by operation or bacteriologically, that:

1. The sedimentation rate is normal in acute simple appendicitis, but after rupture, with either localized or generalized peritonitis or abscess, the rate becomes elevated. It is readily seen how this test, which will give definite information as to the presence or absence of perforation, will be of unlimited value in the surgical management of acute appendicitis.

2. Occasionally, in cases of acute pelvic inflammatory disease, the sedimentation rate will be within normal limits during the first forty-eight hours after the onset of abdominal pain. Beyond this time it is invariably elevated. This finding shows that one must not rely on a normal sedimentation rate in distinguishing appendicitis and acute pelvic disease within the time limit stated.

3. In acute cholecystitis and acute infections of the urinary tract, the sedimentation rate was usually elevated, even early in the disease, but not invariably so.

Bannick¹ hastened to caution that the sedimentation rate, although more trustworthy than

the white blood count, is not infallible and certainly should take second place to a careful history and physical examination.

Summary

Emergency operations are usually lifesaving procedures and the surgeon should choose the most conservative procedure available which is compatible with the problem at hand. Corrective operation can frequently be advantageously delayed until the patient has recovered from the emergency lifesaving operation with less risk to the patient and a better probability of carrying out a complete and curative procedure. This is especially true in acutely perforated peptic ulcer and acute intestinal obstruction. It also holds in the severe grades of acute cholecystitis, acute appendicitis and strangulated hernia.

The sedimentation rate is of definite value in the differential diagnosis of acute abdominal diseases.

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THE TREATMENT OF MENTAL DEFECTIVES IN MINNESOTA*

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THE experience of years has changed the original idea that the purpose of state institutions for the care and treatment of mental defectives is to provide segregation for life, although this is still necessary for the majority of those committed who are idiots or imbeciles. Idiots are individuals with intelligence quotients up to 24 per cent (Kuhlmann scale) and mental ages up to two years; imbeciles are those with intelligence quotients from 25 to 49 per cent and mental

ages from three to six years. However, with the more frequent recognition of the high grade mental defectives or morons with mental ages from seven to eleven years and intelligence quotients from 50 to 74 per cent, larger numbers of this type are, because of associated social problems, being admitted to the institutions for feeble-minded. Unfortunately, the public usually understands that the term moron describes a person guilty of some terrible sex crime. This may be because the lay press tends to refer to such perpetrators as morons. These crimes, usually,

*Read at the annual meeting of the Minnesota State Medical Association May 31, 1939.

however, are not committed by feeble-minded persons but by individuals with psychopathic personalities requiring treatment and control different from that needed by mental defectives.

Many of the moron group can return to their communities to be entirely or partly self-supporting under supervision. This is highly desirable both for humanitarian and economic reasons. Expanded and improved school departments have increased the number of these children who may have the benefit of proper treatment in state institutions through shortening the average time spent there for training. For this reason, each child is carefully studied to determine the amount of academic work that should be taught. The type of vocational training to be given is determined in part by the special aptitude present and in part by whether the individual will return to a rural or urban community. Special attention is given to recognize and correct improper habits and emotional reactions. The educational and recreational programs are planned to try to develop a proper social adjustment.

The new arrival sent to our institution by the Board of Control* after commitment enters first the hospital for fourteen days of isolation to prevent the spread of contagious diseases. During this time, routine physical, neurological, and psychiatric examinations are made as well as laboratory studies of the blood, urine, smears from the nose and throat, the blood Wassermann test, the Mantoux test, an x-ray of the lungs to prove the presence or absence of active tuberculosis, as well as spinal fluid examinations, when indicated. Those unprotected against smallpox are vaccinated upon arrival. Each case is reviewed by the physician in charge with the entire medical staff at the weekly medical rounds and agreement is reached as to the cause and diagnosis of the mental defect present, and of the treatment of physical disabilities present. When necessary, arrangements are made for consultation with specialists in various fields. A full-time dentist checks the condition of the teeth of each child upon admission and takes care of dental needs while in the institution. Special attention is given to provide an adequate and

well-balanced diet, together with special diets when required.

Each week a general Staff Case Conference occurs at which are present the resident physicians, the principal of the school department, the social service workers, and the dormitory division supervisors, with the superintendent presiding. Each new arrival is presented in person with medical, social, and school histories, except for low grades who are cleared by record only. It is determined to which dormitory the child will be assigned; the type of formal training, if any, to be given; or the kind of institutional work to be assigned if training is not necessary or desirable. The newly admitted fall into one of six classes:

1. For segregation, low grade defectives and those seriously crippled. These require continuous nursing care.
2. For segregation, low grade defectives able to do some type of institution work.
3. For segregation, chronic delinquents who are assigned to special locked buildings for each sex.
4. For sterilization and immediate return to the community.
5. Defective delinquent girls transferred for sterilization from the State School for Delinquent Girls at Sauk Center.
6. Those desirable for placement after completing period of training.

The last group is referred to the School Department. On April 25, 1939, this consisted of:

I. Teachers:

One principal and an assistant.
One librarian.
One teacher of music and one bandmaster.
Six pre-vocational or manual arts teachers.
Six industrial teachers.
Eight academic teachers.
Two physical education teachers.

II. Rooms:

Sixteen in the school building.
Six industrial rooms in other buildings.

III. Children:

213 children in the academic department with intelligence quotients above 50 per cent and between six and eighteen years of age.
75 boys in industrial departments, with intelligence quotients from 30 to 50 per cent and between six and eighteen years of age.
99 girls in industrial departments, with intelligence quotients from 30 to 50 per cent and from six to eighteen years of age.

*The Board of Control has been replaced by the Department of Social Security which consists of the Divisions of Employment and Security, Social Welfare, and Public Institutions, as created by the Reorganization Act which was passed by the last legislature. Feeble-minded persons are committed to the guardianship of the Director of Social Welfare, and the School for Feeble-Minded is operated under the supervision of the Director of Public Institutions.

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83 boys in vocational shops and dairy with intelligence quotients above 45 per cent and from seventeen to forty years old.

29 girls in vocational departments with intelligence quotients above 45 per cent and from seventeen to forty years old.

The School Department reports to the Case Conference the record of each child as soon as training is completed to determine whether community placement is desirable. Favorable action occurs only if the individual is considered likely to possess all the qualities necessary to maintain himself in whole or in part under local supervision. If approval occurs, the County Welfare Board is so informed, together with a statement of the appearance, physical condition, training and proficiency, habits, and emotional stability of the individual with the recommendation that plans for placement be undertaken. Placement is recommended by the Case Conference if the members approve the plans submitted. The person is discharged from the institution when authorization is received from the Board of Control, and thereafter is under the permanent supervision of County Welfare Board. Ordinarily, a female in the child-bearing years, or a male, irrespective of age, is not paroled unless sterilized.

Group four, consisting of those admitted for sterilization and immediate return to the community, are represented by cases in which one or both mates in a family are sent to us for the purpose of sterilization, upon the recommendation of the County Welfare Board. They return to their own homes after convalescence. A case in this group is that of a man thirty-two years old whose intelligence quotient was 43. He had lived all his life on a farm and had good habits. All the members of his family were subnormal and depended upon him to do most of the work. When his County Welfare Board learned that he had married, steps were taken to have him committed as feeble-minded and a few days after his marriage he agreed to enter our institution immediately to be sterilized and was then paroled to his home. Another one of this group was a mother, thirty-nine years of age, with an intelligence quotient of 59, who was sent to our hospital during the past year to be confined and who had consented to sterilization thereafter. She gave birth to her fifteenth child, of whom all but one were living. It had been determined before she was sent to us that three

of her children were morons, one was dull-normal, and the others had not had a psychometric examination. Five of them were of preschool age and the attendance of the others at school was intermittent because of the laxity of the parents. The two eldest daughters became illegitimately pregnant at the ages of fifteen and seventeen years respectively, and one of them has been committed as feeble-minded. During the year 1938, twenty-four women, after commitment, were admitted for confinement with the possibility of sterilization if a plan for their return to the community were approved. For seventeen of this group such a procedure is evolving or has been completed. Nine of the twenty-four are unmarried mothers, nine are married and already have families which exhibit degrees of mental defect, while six have been married, and are not living with their husbands—the last child being illegitimate.

The fifth group is made up of girls transferred to us from the State School for Delinquent Girls at Sauk Center. This institution is not one planned for the care of feeble-minded but some are found to be mentally defective after admission and these are committed to the custody of the State Board of Control. However, because of our lack of space, their training is completed at Sauk Center and those considered suitable for placement are sent to us for sterilization. This group will be transferred to an institution for feeble-minded immediately after commitment when sufficient space is provided.

Last August a questionnaire was sent to the County Welfare Boards relative to those on parole from our institution to determine how well they were adjusting to community life. Of 1,190 sent, 906 responses were received, of which 765 referred to females and 141 to males. The data have not been completely tabulated but the reports leave a favorable impression and justify the efforts to return desirable, trained mental defectives to life outside the institution under proper supervision. A study made in Hennepin County March 31, 1939, of individuals on parole from the institution, showed that there were at the time, 102 of 140 females, and 29 of 49 males, employed under the supervision of the County Welfare Board.

Since 1921 our institution has shared with the state in the splendid work done by Dr. F. Kuhlmann as Director of the Division of Examina-

MENTAL DEFECTIVES IN MINNESOTA—ENGBERG

ADMISSIONS

	Moron		Imbecile		Idiot		Total	
	M	F	M	F	M	F	M	F
New admissions	93	151	40	38	25	14	158	203
	244		78		39		361	
Readmissions	24	25	9	3	2	0	35	28
	49		12		2		63	
Total	117	176	49	41	27	14		
	293		90		41			
Infants born or admitted here with mother for nursing care. Returned to county of residence at three months of age.							13	15
							28	
Grand Total							206	246
							452	

tion and Classification of the State Board of Control. All the mental testing done in our institution has been under his direction and all questionable cases have been referred to him for a recommendation as to disposition. Those determined not to be feeble-minded are discharged as soon as other plans have been made for them. Dr. Kuhlmann has been responsible, also, for the broad testing program conducted in all counties of the state. On March 1, 1939, tests showing intelligence quotients of less than 75 per cent had been given to 25,137 persons on an individual basis since 1923 and, during this period 7,256 committed to state guardianship as feeble-minded. However, on that date there was of record a total of 9,144 mentally defective persons receiving some kind of care, treatment, supervision or training at public expense. They were distributed as follows:

- 2510—in the School for Feeble-Minded.
- 493—in other institutions, committed.
- 1450—satisfactorily adjusted outside but committed.
- 1194—committed, awaiting institutionalization.
- 3497—in special classes. This is an estimate. It is the number of children enrolled in forty cities and towns conducting special classes for sub-normal children during this school year 1937-1938. Very few of these are committed as feeble-minded.

ANALYSIS OF DISCHARGES

For the Calendar Year 1938

	Males		Females		Total
	Ster.	Not Ster.	Ster.	Not Ster.	
To county supervision after period of institutionalization	12	5	32	8	57
To county supervision after sterilization only	17		35		52
Supervision of Lynnhurst Club, Saint Paul			24		24
To county other than that of residence (Farm placement)	7				7
To county after confinement and sterilization			15		15
Transferred to other institutions	3	27	3	6	39
Infants returned when three months old to county after birth here or after providing nursing care only, when admitted with mother		13		14	27
Supervision of home school			6	1	7
Escapes		11	6	4	21
Deaths		31	1	12	44
Totals	39	87	122	45	293
	126		167		

The total of 9,144 given above does not include any of the 932 patients in the Colony of Epileptics at Cambridge. The majority of these are mentally defective in addition to suffering from epilepsy, and properly increase the known total of mental defectives in the state to about 10,076.

Annual commitments are now in excess of 700 per year, and the waiting list of 1,200 is already so large that from three to five years elapses after commitment before space becomes available at Faribault. This unfortunate condition

will now become noticeably worse until space at another institution is provided, as in the past two years we have been able to increase our capacity to its maximum. This is shown by the record of inmates in the institution as of April 29 as follows: 2,245 in 1934; 2,263 in 1935; 2,274 in 1936; 2,261 in 1937; 2,373 in 1938; and 2,537 in 1939. Hereafter, new admissions will have to be limited, however, to the number discharged from the institution. Those on the waiting lists will be the problems of the local counties and many of them it will be almost impossible to handle in the community, especially the low grade hyperactive, destructive, or untidy children; or those with bad sex habits in families with other children; and the high grade mental defectives with delinquent tendencies. Arrangements are made by the County Welfare Boards for the unmarried to live with families in boarding homes, or in private institutions of various kinds; while some of the married ones, instead, may be supervised in their own homes—sometimes with their children.

The accompanying tables are presented to show the movements of the population at the Faribault Institution for Feeble-Minded in the calendar year 1938.

The above admissions and discharges occurred during a year in which our average daily population was 2,349 (females 1,126; males 1,223)

and is representative of what will probably be the record in the future except for the reduced number of new admissions.

In closing, it is proper to repeat that although state institutions still play a necessary part, they cannot solve the entire problem of the care and treatment of mental defectives. In other words, the solution is not as simple as merely the commitment to an institution. Rather, the problem is so great that we must plan for reasonable control, rather than for complete solution. This requires the combined, coordinated efforts of the local communities, schools, courts, local county welfare boards, institutions, and the state department. It is essential that physicians in local communities recognize the condition when encountered in practice so that they may personally, or through reference to qualified specialists, give proper advice to the patient's family or welfare agencies and also, when necessary, to properly meet the legal requirements for possible commitment. To diagnose and recognize the needs for low grade mental defectives is not difficult, but to do the same for morons requires a thorough knowledge of this group. The failure to recognize all mental defectives presenting social problems* and the failure or delay in establishing proper control of them results in great expense, unhappiness, and suffering.

PRESENT-DAY TREATMENT OF UNUNITED FRACTURES OF THE NECK OF THE FEMUR*

MELVIN S. HENDERSON, M.D.
Rochester, Minnesota

UNUNITED fractures of the neck of the femur are more commonly encountered among elderly women than among elderly men. Many of the patients manage to get along well enough to meet the economic and social demands made on people of their age, and if so, surgical measures need not be considered.

Selection of Patients for Surgical Operation

If disability and pain, further complicated by social and economic conditions, make life un-

happy, surgical interference may be deemed advisable. The surgeon, however, must be convinced, first of all, that the patient's life expectancy warrants the time and money to be expended by the patient. The surgeon must be sure, also, that the operative risk as to life, infection and so on, is justifiable. Organic heart disease, such as myocarditis and involvement of the coronary arteries, are distinct contraindications to operation, and obesity, if it is at all marked, is an unfavorable factor. Very rarely should a patient who is more than sixty-five years of age be operated upon for an ununited fracture of the hip.

*From the Section on Orthopedic Surgery, The Mayo Clinic, Rochester, Minnesota.

Pathologic Changes in the Hip

The condition and contour of the head and neck of the femur are of extreme importance if surgical intervention is to be considered, and much is to be learned from careful roentgenologic study. If a great deal of the neck of the femur has been absorbed, and if there is great laxity at the site of fracture, the probabilities are that little, if any, fibrous union is present. An idea as to the degree of laxity can be gained by measuring the distance from the anterior superior spine of the ilium to the internal malleolus: first, while the leg is strongly pulled and, second, while a strong push is exerted upward, with the knee held fully extended, and then noting the difference in measurements. Roentgenograms made while the same forces are exerted confirm whether there is much laxity.

The distinction between fibrous union and true nonunion (pseudarthrosis) is important.

Roentgenologic examination gives much valuable information. The degree of absorption of the femoral neck can be determined if the film is made with the foot held upright, or even rotated a bit medially. If the head of the femur casts a dense shadow, the chances are that it is necrotic; if it appears osteoporotic, the chances are that it is viable. In doubtful cases, it is only on exploration of the joint that the exact condition can be ascertained and, even then, it is not always easy to determine definitely the viability of the head.

Types of Operation

An ununited fracture of the neck of the femur causes disability because of lack of skeletal support; the strain of weight-bearing is borne by ligaments and muscles. In a few unusual cases, in which the patients were younger men, I have seen fibrous union become so firm that they could carry on their activities, even at hard labor. Therefore, the prime object of all surgical procedures is to provide skeletal support if the fibrous union is too weak. Sometimes, by waiting several years, the fibrous union becomes strong enough for the patient to get about with a cane. The question of whether to operate is to be decided by the surgeon and the patient in each individual case; definite rules cannot be laid down.

A number of surgical procedures may be used. Such operations are not common and members of the medical profession at large are not as familiar with them as they are with operations for

more common conditions. The first aim in repairing any fracture, recent or old, is to restore the parts as nearly as possible to their normal anatomic condition and to restore to the part its normal physiologic action. In general, there are three headings under which surgical operations for ununited fractures of the neck of the femur can be discussed: (1) anatomic restitution, which gives the best chance of physiologic recovery, (2) furnishing of skeletal support, with retention of as much motion as possible, and (3) obliteration of all function except weight-bearing, motion being eliminated by arthrodesis. The different operations will be discussed according to this classification.

Anatomic Restitution

Operations under this heading aim to save the head of the femur and induce it to unite either with the neck of the femur or with the remodeled upper end of the femur. Motion of the joint is preserved.

Autogenous Bone Graft.—Use of the autogenous bone graft has been advocated for many years, and, in properly selected cases, has brought about many brilliant results. It should be attempted only by those who possess the necessary advantages as to proper hospital facilities, instruments and skill. It can be performed in one of two ways: by the open method (articular osteosynthesis), or by the closed method (extra-articular osteosynthesis).

The open method demands wide exposure of the joint, careful dissection of all fibrous material from between the fragments and meticulous freshening and fitting together of the surface of the fracture. It is especially suited for younger patients who are in excellent general condition. I have traced sixty-seven of seventy-seven patients in whom an autogenous bone graft was used for an ununited fracture of the neck of the femur. This study covered the period of twenty-six years from July, 1913, to June, 1939, inclusive. It is apparent that these operations are not commonly performed. Bony union was obtained in 69 per cent of cases, whereas in 31 per cent the operation resulted in failure (Fig. 1).

The so-called closed, or blind, method of insertion of the graft has come into prominence in recent years and has the definite advantage that the operation is performed without opening the joint. Therefore, there is much less danger to

UNUNITED FRACTURES OF NECK OF FEMUR—HENDERSON

the patient from shock and other untoward events. Before this type of operation is undertaken, all shortening must be overcome by either skeletal or skin traction and the roentgenogram

reamer used is a little smaller than the diameter of the fibula. The reamers are threaded on the wire and therefore cannot deviate from the proper direction. The guide wire must be placed deep in



Fig. 1. Bone graft eleven years after insertion for ununited fracture of the neck of the femur (intra-articular osteosynthesis). Firm union; excellent function.

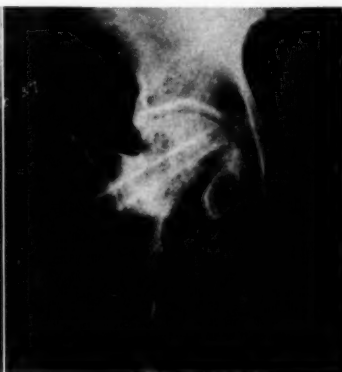


Fig. 2. Solid, bony union with normal function obtained after extra-articular osteosynthesis (fibula). The patient was a woman, sixty-seven years of age, with nonunion of the neck of the femur of one year's duration.

must show that the femoral head and neck are in normal alignment. With this condition of shortening overcome, the bone graft can then be inserted so that, after the operation, it is not subject to any undue stress or strain, the fragments being locked firmly together and the leg put up in abduction so that the position is maintained and the bone graft merely acts to steady it.

Our experience with this method has been encouraging, and I believe that in carefully selected cases it can be used. For this reason, I shall describe the procedure in further detail.

The fibula furnishes excellent material for insertion by the "closed" method, and a full segment of definite length of the bone can be removed, without functional damage, from the middle third of the leg. With the patient on the fracture table, a small, longitudinal incision is made laterally over the trochanter and extends downward for a short distance over the shaft of the femur. A Kirschner wire then is inserted through the trochanter, through the remnant of the femoral neck and well into the head. To be certain that the wire has been properly centered, its position is verified by anteroposterior and lateral roentgenograms. With the wire satisfactorily placed, three cannulated reamers of different sizes are used in series to prepare a channel for reception of the piece of fibula; the last

the head, even penetrating into the acetabulum, or it will loosen and pull out as the reamers are withdrawn. The piece of fibula is slid along the Kirschner wire, and pounded in. One important step in preparing the piece of fibula is the stripping of the muscles and the thorough roughening of the cortex by aid of a chisel, thus producing a roughened and freshened surface and so facilitating the entrance of blood vessels into the graft, furthering its nutrition (Fig. 2).

If the condition is true pseudarthrosis, that is, if there is no fibrous union, this method of blind insertion of the graft, without freshening of the fragments, will probably fail. It is known that the driving of an autogenous bone graft across joint surfaces will not lead to ankylosis because the bone graft will not receive any nourishment where it traverses the joint space and will weaken and fracture there.

Metal Nail for Fixation.—Another method is to open the joint, freshen the surfaces of the fragments and hold them in apposition by pinning them together with a Smith-Petersen nail. There have been no reports, so far as I know, of any sizeable series of patients treated by this method. However, it is reasonable to assume that with good technic and careful fitting of the fragments, good results might be the rule, if the femoral head is not necrotic.

Brackett Operation.—The Brackett operation is a sound surgical procedure. It consists of complete exposure of the hip joint by lifting upward the trochanter and its attached muscles, removing any fibrous tissue between the fragments, freshening of the fracture surface of the head and remodeling of the upper end of the femur, which may mean entire removal of the remnant of the femoral neck in order to fit it accurately to the head. The trochanter, with its attached muscle that has been reflected upward, is brought down and fastened at a lower level on the shaft of the femur. This step is important because it restores normal tension of the muscles. The operation is best suited to younger individuals and the head of the femur must be viable (Fig. 3). It is a major surgical procedure and should not be undertaken if patients are old or debilitated.

Care Following Operations for Anatomic Restitution

Following operations of the types mentioned, namely, bone grafting, nailing or the Brackett operation, it is essential that firm and adequate postoperative fixation be maintained a sufficient length of time for bony union to develop. This cannot be expected to occur in less than three months. Such prolonged fixation may be a trial and burden for elderly and weak persons and entails long confinement in the hospital. The stiff knees so often encountered following prolonged fixation are further complications that greatly retard convalescence.

Reconstruction Procedures, the Objects of Which Are to Furnish Skeletal Support

If, because of a necrotic femoral head, advanced age, and so on, the more nearly ideal procedures that aim at anatomic restitution cannot be carried out, the aim has to be merely to restore skeletal support and to save as much motion as possible.

Whitman Operation.—Royal Whitman, famed for his advocacy of the closed treatment of fresh fractures of the neck of the femur, later described a reconstruction operation since known by his name, for nonunion of the neck of the femur. The essential points of the operation are removal of the head of the femur, remodeling of the upper end of the femur, which is then placed in the acetabulum, and moving the trochanter, with its attached muscles, to a lower level on the shaft of the femur (Fig. 4).

Colonna Operation.—Paul Colonna has developed a procedure somewhat similar to that of Whitman in that the head of the femur is removed and also the remnant of the neck. Colonna carefully strips the trochanteric muscles from the trochanter, gathering them together by aid of a purse-string suture. The trochanter is placed in the acetabulum, with the hip in abduction, and the reflected muscles are fastened, by aid of the purse-string suture, through a hole bored through the shaft at a lower level, thus keeping the gluteal muscles under normal tension (Fig. 5).

Albee Operation.—Albee has advocated a reconstruction operation wherein the head of the femur is removed also, but, in addition, perpendicular osteotomy, from downward, at the junction of the neck and the trochanter, is performed and the outer fragment, with the trochanter and its muscles, is pried outward. He then puts the upper end of the femur in the acetabulum and, in order to hold the trochanter and its muscles outward, inserts in the cleft left by the osteotomy such an amount of the head of the femur as is necessary to maintain the fragment in its lateral position. The object of this last step is to provide leverage for the trochanteric muscles.

Care Following the Whitman, Colonna and Albee Operations

Postoperative fixation is extremely important for the success of any one of these reconstruction procedures. The hip must be maintained in a well abducted position long enough to insure reattachment of the muscles to the femur, so that they can institute motion of the reconstructed joint when the cast is removed. This position should be held from three to four weeks, but flexion of the hip may be passively carried out and thus the knee exercised as early as two weeks after operation. The institution of motion of the knee as early as possible is greatly to be desired and definitely shortens convalescence. These operations give bony stability but many of the patients are forced to resort to the aid of a cane or crutch in walking any great distance. However, on the whole, the results are satisfactory and well worthwhile.

Other Procedures that Furnish Skeletal Support

High Osteotomy.—Of recent years, it has been argued that if the line of weight-bearing could be altered and the lower fragment brought well

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inward beneath the head, the shearing force, when weight-bearing is attempted, will be abolished. To this end, the high osteotomy, effected really between the greater and lesser trochanters,

is durable and in the main unsuitable for elderly patients, and, second, it is not easy really to obtain bony ankylosis in the elderly. It would seem that pain is the chief indication for its use, but usual-



Fig. 3. Result ten months after Brackett operation.



Fig. 4. Result three years after Whitman reconstruction operation.



Fig. 5. Skeletal weight-bearing accomplished by Colonna operation.

has been advocated strongly by McMurray of Liverpool. He has reported that function has been much improved and he has stated further that in many cases healing has progressed to bony union after this new line of weight-bearing has become established. I have had too little experience with this operation to express an opinion. More definite information no doubt will be at hand shortly, for the operation is being performed with increasing frequency in a number of clinics in America.

Low Osteotomy.—Lorenz, of Vienna, advocated low osteotomy, effected below the lesser trochanter, and placing of the upper end of the lower fragment in the acetabulum. He recommended this operation for irreducible congenital dislocation of the hip. Somewhat the same procedure has been advocated for ununited fracture of the hip. In such an operation the upper end of the lower fragment is placed just beneath the femoral head. I have had no experience with it.

Arthrodesis for Stability

If none of the aforementioned procedures is deemed advisable, if the patient is incapacitated seriously and perhaps is suffering with much pain, arthrodesis of the hip joint should be considered. However, a stiff hip is an awkward affair if the patient is elderly. Arthrodesis has been resorted to rarely in America for this condition, first, because it is a major surgical proce-

ly this can be controlled by limitation of activities.

Summary

Ununited fractures of the neck of the femur can be treated surgically if the patient is in good general condition and has an expectancy of life that warrants surgical measures.

The types of operation can be grouped under three headings: (1) those that aim at securing anatomic restitution, with bony union of the fragments, (2) those that aim, by the so-called reconstruction operations, to furnish skeletal support and still to allow motion, and (3) arthrodesis that aims to furnish only skeletal support with complete loss of motion.

No rules can be laid down as to what patients should be subjected to surgical measures or as to what type of operation should be employed. Each case must be considered individually and the decision made on the basis of the findings.

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SURGERY OF COMMON AND HEPATIC DUCT CALCULI*

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BILIARY surgery, like modern surgery in general, is of such relatively recent development that it is little wonder the biliary ducts have been slow to receive the attention they merit. The origin of attention is so recent as to be within the life span of some to whom today the problem is of everyday occurrence.

It was June 15, 1882, when Carl Langenbuch of Germany performed the first cholecystectomy. In 1887, Justus Ohage, Sr., once president of the Minnesota State Medical Association, first performed cholecystectomy in America. Although cholecystectomy is among the most frequently performed of abdominal procedures and usually is accomplished without difficulty, it may be one of the most difficult problems. When the ducts contain calculi the situation becomes more serious for the patient and technically more difficult for the surgeon.

Frequency of Ductal Calculi

The most common cause of recurrence of colic following cholecystectomy is choledocholithiasis. Lithiasis is the most common cause for secondary operations on the biliary tract, with stricture next in frequency. When cholecystectomy is performed without giving attention to the ductal system, calculi are being left in the ducts in from 10 to 20 per cent of the cases. Wilkie¹⁵ reported removing one or more calculi from the common duct in 18 per cent of 257 cases of cholelithiasis. Ravdin,¹¹ in a study of ninety-five cases of cholelithiasis, found ductal calculi in over 14 per cent. Lahey⁶ has estimated the average incidence at 20 per cent. Cutler² recently reviewed 397 operations for cholelithiasis performed between 1934 and 1938 at Peter Bent Brigham hospital. Common duct stones were found in 18.6 per cent of all cases, in 51 per cent of common ducts opened. There was no mortality in seventy-one cases, where the duct was opened and no stones were found.

The frequency with which calculi are found in the common or hepatic ducts, therefore, seems to be in direct proportion to the diligence and com-

petence of the surgical attention to the ductal system. Obviously, careful examination of the common duct should be a routine consideration in every operation on the biliary tract.

The first step in the prevention of recurrent colics following cholecystectomy, therefore, is the recognition and management of choledocholithiasis *at the original procedure*. The anatomy then is defined more clearly and the tissues dissected more easily. The problems in secondary operations on the common duct, often in anemic and jaundiced patients, are much more formidable. As shown in many studies, not only the common duct but the whole biliary tree and the interrelated organs must be considered in surgical treatment of the biliary system.^{5,7}

The following study is based on personal experience and a review of the surgery of ductal calculi at the Minneapolis General Hospital from January 1, 1928, to January 1, 1938, when 283 cholecystectomies for cholelithiasis were performed. The common duct was opened twenty-nine times and calculi were removed from the common and hepatic ducts in fourteen cases. The common duct was opened more freely in the latter half of the decade.

Diagnosis of Choledocholithiasis

It is recognized today that calculi may lie dormant in the ductal system for years. Symptoms follow sooner or later in most cases. Symptoms arising from common or hepatic duct calculi are those of cholecystic disease plus jaundice. If symptoms persist following a typical attack of biliary colic, disturbance in the ducts should be suspected.

Colic is the most common and characteristic symptom of choledocholithiasis. In this series of common duct calculi, colicky pain was present in 85 per cent of the cases. In 14 per cent the pain was dull and boring. In the largest recorded series,⁴ pain was absent entirely in 2.4 per cent of cases.

The most frequent cause of jaundice of all types is common duct calculus. Jaundice was present in 85 per cent of the patients in this series. Chills and fever were present in one out of

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three of the patients. Other gastro-intestinal disturbances were present in most cases. Nausea and vomiting were present in eleven of the fourteen cases in which calculi were removed from the common duct.

No one is infallible in the differential diagnosis of jaundice. A gallbladder may be distended in cases of choledocholithiasis and contracted in malignant obstruction. Colic may occur in cases of carcinoma and not infrequently is absent in cases of stone. Pylorospasm may be the only symptom of a common duct calculus. But a guess is a poor peg when the thread of a human life hangs on it. Exploration is therefore indicated in all cases of probable ductal obstruction where such examination can be carried out within reasonable risk.

Watson^{13,14} has been very successful in distinguishing calculous, cancerous, parenchymal, and hemolytic forms of jaundice by determining the excretion of urobilinogen in urine and feces.

If common duct obstruction is complete, the serum bilirubin will become fixed at from 20 to 30 milligrams for each 100 c.c. of blood, with the icterus index usually between 150 and 200 units. The jaundice of common duct calculi, however, is almost always intermittent. The intermittency of symptoms provides an excellent diagnostic clue. If a Rehfuß tube is passed three or four times, bile can almost always be recovered if obstruction is due to calculus.

Surgical Preparation

Operation is best performed when the serum bilirubin is normal, or tends to be on the decline, or is not increasing; and best not performed until after attempts to reduce prothrombin time. If the jaundice does not recede within two weeks, the common duct should be explored usually. Patients with deep jaundice of short duration are better risks than patients with less jaundice of long duration. Blood transfusions are helpful in reducing the incidence of hemorrhage and improving the patient's resistance. Of great value is the restoration of glycogen reserve in the liver.⁸

Increasing use of vitamin K substances and bile salts in cases with prothrombin deficiency has decreased considerably the need for blood transfusions in the control of the bleeding tendency.

Methods used for measuring bleeding tendency in a jaundiced patient still are far from perfect.

Quick's¹⁰ method for determining thromboplastic activity has proven useful clinically. Simpler and more practical for bedside use, especially in smaller hospitals, is a test recently developed by Ziffren and associates.^{16*}

Within recent months the structure of the vitamin K (from alfalfa) molecule has been found to be 2 ethyl-3 phytyl-1, 4-naphthaquinone and the compound has been synthesized. Other quinones have been found to have vitamin K activity.

At the present time it seems best to determine prothrombin clotting time in each patient with jaundice and give concentrates of vitamin K and bile salts prophylactically in each such patient before operation. If the prothrombin time is prolonged such concentrates and bile salts should be given until the prothrombin time is within normal limits. After operation prothrombin values should be determined daily for three or four days, then every other day until the ninth or tenth postoperative day. When prothrombin deficiency is found, vitamin K concentrates and bile salts should be given. Where prothrombin deficiency is shown before operation it is wise to give such treatment postoperatively regardless of prothrombin values. When marked hepatitis is found at operation it seems wise to give vitamin K and bile salts postoperatively regardless of prothrombin values. Intravenous injections of glucose and blood transfusions should not be ignored in combating the bleeding tendency.

Indications for Opening Common Duct

When should the common duct be opened? Routine choledochotomy has a few advocates; but such a policy appears to be too radical. Puestow and Morrison⁹ measured the common duct in 527 routine necropsies showing no biliary tract disease and found the average circumference in adults to be 12.1 millimeters. In other words, in a person of average weight, the common duct is

*One-tenth cubic centimeter thromboplastin is placed in a three cubic centimeter tube and freshly drawn blood added up to the one cubic centimeter mark. The tube is inverted once and tilted gently every few seconds and the clotting time observed. This is repeated in a normal individual.

$$\text{Clotting activity (In percentage of normal)} = \frac{\text{Clotting time of normal}}{\text{Clotting time of unknown}} \times 100$$

The above has been found to agree within 15 per cent with quantitative tests. With prothrombin below 30 to 50 per cent, bleeding tendency appears. Above this level blood clots at a normal rate (six to ten minutes).

To prepare thromboplastin, extract 10 grams of ground brain or lung (ox or rabbit) two hours with 10 cubic centimeters saline, strain and preserve in an icebox. If normal exceeds sixty seconds the thromboplastin should be rejected; if less than twenty-five seconds thromboplastin should be diluted with saline.

about the size of a goose quill. Routine exploration would prolong the operation, increase the operative risk and increase the frequency of the second most common cause of secondary biliary operations—stricture of the duct from operative injury. Calculus or other obstruction is followed practically always by dilatation of the duct or thickening or discoloration of its wall.

On the whole, according to present knowledge, it would be wise to open the common duct when:

1. *A calculus is felt or suspected.* Palpation of the common duct should be as much a routine in cholecystectomy as palpation of the gallbladder itself. It is much more difficult to palpate smaller stones which may not be giving symptoms but which may increase in size and cause difficulty later. The common duct is palpated with the index and second fingers of the left hand in the epiploic foramen and the thumb above the hepatico-duodenal ligament. Often it is best to catch the stone between the thumb and fingers and open the duct directly upon it. A floating stone may be milked up from the lower duct and fixed in a favorable position for removal. On occasion, lymph nodes in the gastrohepatic omentum and localized indurated areas in the pancreas cannot be distinguished from calculi by palpation.

2. *When the duct is definitely dilated or thickened.* The enlargement should be beyond the compensatory dilatation accompanying autocholecystectomy.

3. *In the presence of cholangitis or pancreatitis.* Drainage in such instances is indicated in any event. About one in ten common duct stones are in the ampulla. In two out of three patients, the common duct is surrounded completely by pancreatic tissue in the terminal portion.

4. *In the presence of a history of chills, fever, and jaundice.*

5. *In the presence of recurrent or intractable symptoms following biliary operations of any kind.*

Major influencing factors may be: (a) a history of pronounced involuntary vomiting where a stone is not found impacted in the cystic duct; (b) markedly thickened or contracted gallbladder; (c) the presence of small stones in the gallbladder together with a dilated cystic duct; and (d) a history of severe and persistent colic.

Technic of Common Duct Operation

Adequate exposure of the ducts is essential. In the presence of cholelithiasis the gallbladder should not be removed until the ductal system has been examined properly and the organ should not be removed without assurance that the common and hepatic ducts are free of calculi. Exploration through the cystic duct stump is rarely if ever feasible. In the presence of jaundice associated with infection of the biliary tree, it may be wiser in rare instances to drain rather than remove the gallbladder.

A commonly used and practical incision is started high in the angle between the costal cartilage and the xiphoid and extends down not more than 1.5 or 2 cm. from the midline to a point opposite or a little below the umbilicus. The right rectus muscle is split or retracted. The posterior aponeurosis, peritoneum and the nerves in the lower third of the incision are preserved. The incision is from 4 to 5 cm. longer through the fat and subcutaneous tissues than through the fascia. There should be no hesitancy to extend the incision to obtain good exposure.

It is possible to remove calculi in practically all instances by the supraduodenal approach (Kummel's operation, Thornton's operation). The retroduodenal approach (Hassler's operation) is mainly of historical interest now. In very rare instances it may be necessary to open the duodenum at a point 8 cm. distal to the pyloric vein and free the stone either by cutting the sphincter (McBurney's operation) or by transduodenal choledochotomy (Kocher's operation).

By the supraduodenal approach the peritoneum covering the common duct is split parallel to it. The common duct is exposed by blunt dissection. A small artery along the ventral surface of the duct may cause troublesome bleeding. Occasionally the portal vein will lie in the lateral and anterior portion of the hepatico-duodenal ligament usually occupied by the common duct. Because of this it is safe to aspirate with a needle before opening what seems to be the common duct. Unless opened directly upon a stone, the common duct is incised longitudinally about a centimeter below the entrance of the cystic duct. It often is wise to aspirate what appears to be the common duct for bile before incision is made. The duct on either side of the incision may be fixed by two Allis forceps or two fine silk ligatures may be placed.

Insertion of 3 mm. to 8 mm. scoops and a forceps, as well as manual palpation on the inserted scoops may aid in locating a calculus, especially in the ampulla. As many calculi as pos-

Drainage of Common Duct

Operative procedures on the common duct rarely fail to require drainage, with this need continuing up to weeks, months and in some in-

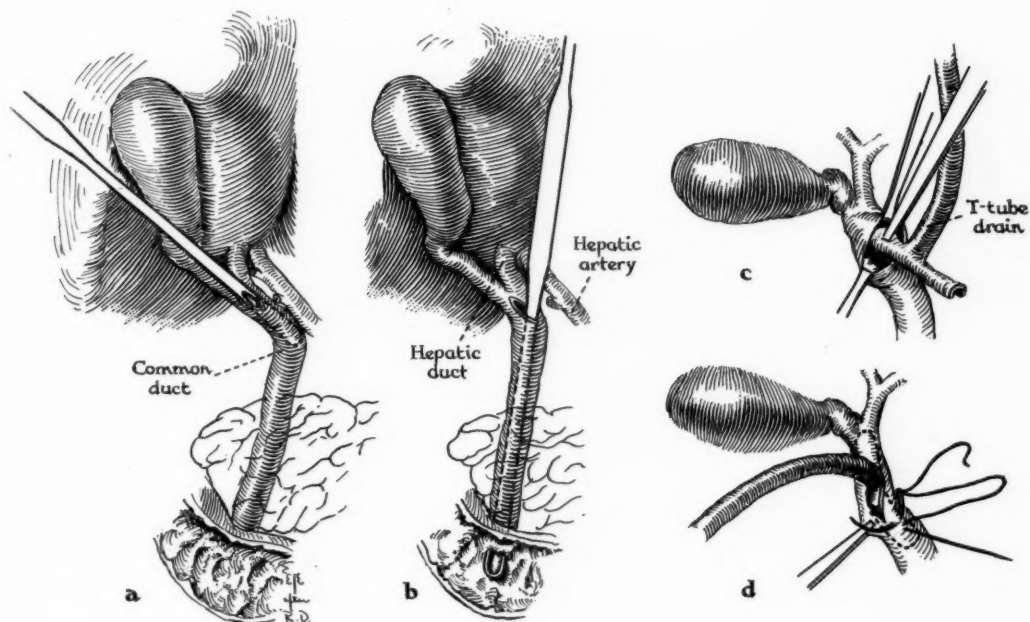


Fig. 1.

sible may be scooped out. Sometimes stones in the hepatic ducts can be flushed down by physiological saline injected into a catheter. Suction may assist delivery of certain stones. Calculi in the substance of the liver are reported rarely, although they must be more frequent than hitherto suspected. Crump¹ studied 1,000 consecutive autopsies in 1931 and found hepatic duct stones in 13 per cent. In a large duct, and when feasible, the finger is the best exploring instrument.

The choledochal sphincter may be dilated gently by graduated rounded scoops or catheters. But caution should be exercised in dilating the sphincter. Recent studies in dogs and man¹⁷ showed traumatic reaction with subsequent spasm and scarring of the sphincter following marked dilatation. Use of catheters insures gentleness in the ampullary and sphincter region. A small catheter (10 F) may be passed through the papilla and saline injected to note filling of the duodenum, indicating the duct is open. Then a larger catheter (16 F) may be passed.

stances years. Three types of drainage tubes may be used: (1) T-tube, (2) L-shaped rubber catheter (Horgan³), or (3) an ordinary urethral catheter. The two limbs of the T-tube crosspiece are cut to about 2.5 centimeters before insertion. It is possible to injure the duct during removal of the T-tube. Cutting a window opposite the vertical limb or removing the bottom half of the crosspiece will reduce such risk. Instances are known of the transverse portion of the tube's having broken off and remained in the common duct. A straight catheter is not adaptable for prolonged periods of drainage. The common duct may be closed with two layers of 00000 chromic catgut on an intestinal needle.

A T-tube can be left in as long as necessary and removed easily, often without anesthesia. Intravenous pentothal or evipal soluble anesthesia may be used if necessary. With a T-tube the flow of bile can be controlled better by clamping, fluids for feeding can be given, the ducts irrigated and roentgenograms made of the biliary

tree. Ten to 20 cubic centimeters hippuran is a good contrast medium for cholelithochograms.

Often the drainage tube can be removed during the second or third week following operation. With deep jaundice and marked cholangitis and hepatitis or pancreatitis, prolonged drainage is indicated. The tube should not be removed until the cholangiogram shows the biliary tree has approached normal structure, that no filling defects suggestive of stones are present, and that the opaque medium empties readily into the duodenum (within ten minutes). There should be no discomfort to the patient and no drainage around the tube when it is clamped before removing it. It may be several months before such requirements are met. Tubes have been known to be in place many years without difficulty. Wangenstein¹² has observed a patient carrying common duct catheters for six years.

Summary

A study of surgery of common duct stones encountered in 283 cholecystectomies is presented together with the observations from personal experience and the work of others. Common duct calculi occur in one to two of ten cases of cholecystitis with stones and practically always are best taken care of at the time of the original cholecystectomy. Opening a duct and finding no

calculi should not increase the mortality rate. Indications for opening the common duct are given.

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FULMINATING ULCERATIVE COLITIS

A Critical Analysis of Twenty Cases

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THE course and progress of various forms of ulcerative colitis have been depicted as insidious, severe and fulminating.^{1,2} It has been pointed out that in some cases in which the "fulminating state with progressive severity" exists, death may be the sequel of a most distressing and irresistible illness.

In recent months, many patients with chronic ulcerative colitis have been observed during fulminating exacerbations of their illness. These are patients in whom the disease is definitely not tuberculous or amebic in origin, but in whom

it is of the varieties of types 1, 2, 3, 6 or 7.³ It was felt that a critical study of a number of these cases might be of value.

Approximately 300 cases of chronic ulcerative colitis have been seen at The Mayo Clinic during each of the last three years. In those years between five and seven patients have died from this disease annually. The cases selected for study represent the last ten patients with a fatal outcome of chronic ulcerative colitis prior to August 1, 1939. As a basis for comparison, an analysis was made of ten similar cases of fulminating ulcerative colitis in which the patient recovered. This investigation represents an at-

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tempt to make a critical analysis of the factors contributing toward the mortality in these cases and of the value of our therapeutic efforts, together with an attempt to improve our management of similar cases in the future.

General Data

The ages of the patients in the fatal group ranged between five and seventy-two years, the majority being in the third and fourth decades of life. The ages in the group which recovered ranged between fourteen and forty-two years, the majority being in the third decade. There were four men and six women in the fatal group, while in the group which recovered there were five of each sex. It may be of some interest that nine of the twenty patients were of the Jewish race, five of whom died and four recovered. The patients came from varied walks of life and scattered locations. Most of the patients had enjoyed good general health prior to the onset of the colitis. One of the patients in the fatal group had had attacks of biliary colic, one had had a renal calculus and one had had a duodenal ulcer. In the group which recovered one of the patients had rheumatic endocarditis.

Duration of Illness

There was no correlation between the duration of the illness and the outcome. In the fatal group, the shortest duration of symptoms was seven weeks. Three patients had had their symptoms for less than a year. In the remainder the duration ranged between two and six years. In the group which recovered three of the patients had had their symptoms for less than a year. In the remainder, the duration ranged between one and eight years.

Onset of Illness

The onset of the disease was insidious in five of the fatal cases and in seven of the nonfatal cases. In the remainder of the cases the onset was severe. In all cases in which the symptoms had been present for more than five months before admission, they were intermittent. In the fatal group, in six of the cases the disease became fulminating two to three months before admission to the hospital. In the remaining four, the disease became fulminating while the patient was in the hospital under treatment. In the group which recovered, the disease became

fulminating in eight of the cases during the month preceding admission, while in the remaining two, this change occurred during the patients' stay in the hospital.

Predisposing Factors

In five of the cases in the fatal group, the onset of the attack of colitis from which the patient died was associated with a period of undue nervous stress. In one case an exacerbation followed a dental extraction. In two cases an upper respiratory infection preceded the relapse. In the group which recovered, three of the patients had upper respiratory infections prior to their "flare-ups." Practically all of the patients presented one striking characteristic, regardless of their age or sex, namely, a tense, high-strung, nervous temperament, in most cases associated with a strong tendency toward uncooperativeness.

Type of Chronic Ulcerative Colitis and Extent of Disease

Only five of the cases of the fatal group were definitely of the streptococcal variety, which we have designated as type 1. The other five were of type 3,³ a nondescript form of ulcerative colitis with irregular proctoscopic, roentgenologic and clinical pictures and one in which the causation is not clear.

At the time of admission, roentgenologic study revealed involvement of the rectum and sigmoid alone in one case in the fatal group. In one case the disease process extended as far as the splenic flexure and in one case as far as the hepatic flexure. The entire colon was involved in two cases. In one case no involvement was demonstrable until the disease had progressed to such a degree that further studies could not be made with safety. Four of the patients were too ill to undergo roentgenologic examination. At necropsy there was involvement of the entire large intestine in all cases.

In the group which recovered, eight cases were of type 1 and two were of type 3. In one case the rectum and sigmoid alone were involved when the patient was first examined. The disease process extended as high as the splenic flexure in one case. In seven cases the entire colon was diseased, while in another case the entire colon and the terminal ileum were also involved.

Proctoscopic examination showed active dis-

ease of the bowel wall in all cases of both groups.

Bacteriologic Studies

In the fatal group, the streptococcus of colitis (Bargen¹) was isolated from the stools in only two cases. Streptococcus faecalis and Streptococcus zymogenes were found in one case. The stools in the remaining cases revealed no unusual bacteria. Blood cultures made in four cases failed to grow bacteria. Serologic agglutinations for typhoid fever, paratyphoid fever and paratyphoid fever were negative in four of the five cases in which these tests were performed. However, in the fifth, a test for Shigella paradynteria (Flexner) was reported positive (1-640) but the organisms were absent from the stools in repeated cultures.

In the group which recovered, the streptococcus of colitis (Bargen¹) was isolated from the stools in nine cases. One of these stool specimens also was found to contain Salmonella enteritidis. Blood cultures were made in five cases but no bacteria grew. The results of the serologic agglutination tests for typhoid fever, paratyphoid fever and paratyphoid fever performed in three cases were reported negative.

It is of interest that one of the patients in each group had undergone treatment for amebiasis prior to admission. One patient in the fatal group had been treated for bacillary dysentery and one in the group which recovered had been treated for paratyphoid fever without improvement before admission.

Blood Picture

All patients, except one in the fatal group, showed moderate to severe anemia on admission. Leukocyte counts were for the most part slightly elevated but in only two cases did they exceed 15,000 in each cubic millimeter of blood on admission. No correlation was apparent between the leukocyte count and the severity of the disease. Differential counts showed nothing characteristic but study of the smears revealed a toxic blood picture as indicated by a reversal of the normal filament-nonfilament ratio. The sedimentation rate was elevated in all cases. In three of the cases in which bleeding was a prominent feature, prothrombin deficiency was demonstrated. In each of these cases bleeding ceased

and the prothrombin values approached normal following administration of vitamin K.

Course

The clinical picture and progress of these patients during their stay in the hospital made possible the recognition of two distinct groups. Patients whose symptoms were in the main those produced by a severe thrombo-ulcerative process in the wall of the large bowel composed the first group. These patients had high fever, toxemia, dysentery, hemorrhages, signs of peritoneal irritation and sometimes even actual perforation of the bowel wall. The second group was composed of patients whose predominant symptoms were secondary to the changes in the bowel wall. These were the patients with marked deficiency states, characterized by severe anemia, emaciation, low serum protein, edema and ascites, and in whom fever and toxemia were less prominent features.

Among the patients who died, seven fell into the first group and three into the second. Among the patients who survived, seven fell into the first group and two into the second. One of the survivors began in the first group, but following ileostomy his symptoms became predominantly those of the second group. In general, if the disease process continued at a fulminating level for more than five weeks, signs of deficiency were found to appear.

Complications

These were more common and of a more severe nature in the fatal group than in the non-fatal group. Perforation was the most serious complication and one of the most common in the fatal group. The development of jaundice was an infrequent and inauspicious occurrence. From a prognostic standpoint the development of severe edema seemed to be a discouraging sign. Table 1 indicates the incidence of complications.

Cause of Death

Among the patients who died, peritonitis was the cause of death in five cases. One patient with femoral phlebitis died from pulmonary embolism. Overwhelming toxemia was the cause of death in two cases. The seventy-two-year-old patient died of coronary occlusion. In one case, the cause of death was thought to be acute yellow atrophy of the liver.

ULCERATIVE COLITIS—SCHLICHE AND BARGEN

TABLE I. INCIDENCE OF COMPLICATIONS IN FULMINATING THROMBO-ULCERATIVE COLITIS

Complication	Occurrence among ten patients who died	Occurrence among ten patients who survived
Perforation; peritonitis	6	1
Hemorrhage	2	1
Perianal abscess; fistula	2	6
Polyps	3	2
Contraction; stricture	4	7
Carcinoma	1	0
Jaundice	3	0
Arthritis	0	2
Neuritis	0	1
Otitis media, acute	1	0
Stomatitis; pharyngitis	4	2
Parotitis	1	0
Urinary tract infection	1	0
Cutaneous lesions	0	3
Abscesses (other than perianal)	1	0
Phlebitis	1	1
Edema; ascites	8	3
Total	38	29

Treatment

The treatment of all patients was carried out along the same general lines. When their condition permitted they received a low residue diet, rich in proteins and vitamins. In the presence of peritoneal irritation or impending perforation, feedings were stopped and fluid, nourishment and medications were given parenterally. Vitamin concentrates were supplied liberally.

Antistreptococcic serum (Bargen¹) was administered intramuscularly to eight of the patients who died but only three received what we have considered an amount having therapeutic effect. Two of these patients received only a few isolated injections before death. Small doses of this serum were administered intravenously to three other patients in this group. All of the patients who recovered received an adequate

course of serum therapy. Three of them also were given serum by intravenous injection and one of them received several large doses of antidysenteric serum by this route.

All but one of the patients who survived received colitis streptococcus (Bargen¹) vaccine before discharge. Only two of the patients who died had the benefit of this form of therapy.

Eight of the patients who died received courses of treatment with sulfanilamide or neoprontosil, most of them in amounts which have been of value in the milder cases. Only three of the patients who recovered received these drugs.

Ileostomy was performed on two of the patients in the fatal group and on one of the patients who survived.

Other forms of therapy included blood transfusions, liver extracts, 100 per cent oxygen, courses of emetine, atabrin, various arsenical preparations, histidine hydrochloride and glycine. Sedatives and symptomatic treatment were administered as indicated.

Among the patients who died, four were extremely ill on admission and followed a steady downhill course in spite of everything that was done. One patient seemed to be benefited by therapy but succumbed to a heart attack. The remaining five patients, comparatively speaking, were only moderately ill at the time of admission, yet each of them took an unexpected turn for the worse while under treatment. In one case, an upper respiratory infection seemed to be the precipitating factor. A second was a case of type 3 in which lesions were not noted at the time of the first proctoscopic examination but in which severe ulcerative disease was noted at a second examination two weeks later. In two cases, the cause of the exacerbation was not apparent but the subsequent development of jaundice and coma indicated severe liver damage. In the fifth case, no explanation was at hand.

Among the patients who survived, a single factor to which the credit could be given for the improvement which took place was not apparent. In one, a dramatic response seemed to result from intravenously administered anticolitis serum and in another from the use of 100 per cent oxygen. In another, emetine hydrochloride seemed to alter the course of events. Autogenous vaccine, carbarsone, antidysenteric serum and anticolitis serum, each in its turn, seemed to be the deciding factor. The relief of anasarca by salyr-

gan was followed by prompt general improvement in one case. Surveying the group as a whole, it is apparent that the important feature in the management of these cases was the institution of a well balanced program along the lines outlined at the beginning of this section. Rest, diet, sera and vaccines, neoprontosil and symptomatic measures combined to produce a salutary effect which does not seem to have been achieved by any one measure alone.

Sulfanilamide and neoprontosil represent the latest addition to the therapy of ulcerative colitis. Many patients suffering from chronic ulcerative colitis, especially of the streptococcal and of the "insidious" to "severe" variety, derive unquestionable benefits from the administration of these drugs. However, the institution of this type of treatment often is attended by a transient increase in the number of daily bowel movements, with malaise, nausea and sometimes slight hyperpyrexia. One wonders whether more severe reactions, the "unexplained exacerbations" in the hospital, may not in some cases have been related to the use of sulfamido preparations. In four of the cases herein discussed exacerbations developed following courses of neoprontosil. All of the patients who became jaundiced had received sulfanilamide derivatives. The exact rôle which sulfamido drugs played in the production of these undesirable reactions is difficult to determine, but their occurrence should serve as a warning that the sulfamido group of drugs should be used with caution in the treatment of "chronic ulcerative colitis," particularly of the "fulminating" type.

Summary

A study of ten fatal cases of fulminating thrombo-ulcerative colitis and other severe ulcerative colitis and of ten cases in which the patient recovered has been made. Most of the patients were in the third or fourth decade of life. Nine of the twenty patients were Jews.

The severity of the disease and the outcome bore no relation to the duration of the symptoms,

the mode of onset, the type or extent of involvement of the colon at the time of admission or to the blood picture. The similarity in the course of the two groups of cases is emphasized by the fact that in each group there were seven cases with severe sepsis and two or three with secondary deficiency states.

Streptococci of colitis (Bargen¹) were recovered from the stools in all but one of the cases in which the patient survived but in only two of the cases in which the patient died.

In most cases the clinical picture and course were produced or, at least, influenced by the severity of the infective process but in a certain number a secondary deficiency state was the predominant feature.

Perforation, jaundice and edema were the most serious complications from the standpoint of prognosis. Perforation and peritonitis were the most common causes of death.

No one drug or procedure is curative in "chronic ulcerative colitis" of this fulminating variety. A well planned program, including the use of serums and vaccine and embracing dietary and medicinal aids, seems to be the best form of treatment. It is important to point out that each of the ten patients who survived received what we considered an adequate course of serum. Few of the ten who died received amounts of serum worthy of comment. Nine of the patients who survived received anticolitis vaccine as well. Only two of the patients who died received the vaccine.

The use of sulfanilamide and neoprontosil in the treatment of chronic ulcerative colitis is still in a trial stage. Although of proved value in many cases of this disease, its use is not entirely unattended by danger, especially in cases of the fulminating variety.

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The early symptoms of renal tuberculosis are not appreciated, and genito-urinary tuberculosis is regarded as a disease by itself and not as a manifestation of a generalized tuberculous condition. As a result, adequate convalescence and expert after-care are not insisted upon. Sanatorium treatment and continued supervision after operation or local treatment will favorably influence the general prognosis. J. Carver, M.D., *Tubercle*, April, 1939.

HISTORY OF MEDICINE IN MINNESOTA

HISTORY OF MEDICINE IN WINONA COUNTY

(Continued from April issue)

In July of the year of its incorporation, the Winona County Medical Society adopted a regulative fee table and passed resolutions on such matters as interest on unpaid accounts and reduced fees for the poor. Dr. Sheardown was president during the year 1870 and Dr. Cole in 1871. By that time the organization was strengthened and special semi-monthly meetings were held for the discussion of questions such as "The Use of Sulphuric Ether in Obstetrics," "The Use of Hydrate of Chloral," and other topics of interest to the profession. At another meeting, Dr. McGaughey read a paper on the "Purity and Proper Preparation of Medicine," after which a discussion of the merits of different manufacturers and of the city druggists took place.

Another essay by Dr. McGaughey was read at a meeting in 1874 on "Cholera Infantum" in which, aside from the medical treatment, he dwelt emphatically upon importance of utmost cleanliness in the entire surroundings. At the same meeting, Dr. Staples presented an interesting case of congenital deformity which evoked much discussion.

As early as the year 1872 a preparatory medical school was organized in Winona City. It proposed to give preparation for admission into medical colleges. Students were divided into two classes of which the first included those who had not attended college lectures. These received instruction in the fundamental branches. The second group, comprising those who had attended one course of lectures, received instruction in the advanced branches. The school had recitation and dissection rooms and an anatomical and pathological museum. Drs. Franklin Staples, J. B. McGaughey, James M. Cole, D. A. Stewart, and A. P. Gilmore composed the original board of instructors. During the decade or more of its existence, other doctors served on the faculty. Drs. A. B. Stuart, F. Lessing, S. B. Sheardown, and A. Young taught at different times. The original board of instructors, however, was the backbone of the organization and they continued their services from the beginning until the school was discontinued between 1882 and 1886.

Dr. Darwin A. Stewart, who had much to do with the school, was a typical pioneer physician, who built up a large practice, and endeared himself to a large circle of patients and friends. He settled in Winona in 1870 and remained there until his death in 1914. During this time he held many public offices and positions of honor in the community.

The physicians of Winona County numbered about one hundred in the year 1870. Many of them practiced at Winona, the population of which, estimated at eight thousand, comprised more than a third of the inhabitants of the county. Several small towns had no physician and called upon those of Winona in times of need. Elba, with a population of 700, Minnesota City, Dresbach, and New Hartford had no physicians during the early seventies. Occasionally Winona physicians were called outside the county or across the river.

During the seventies the birth rate, as indicated by figures for the county and

for the city of Winona, greatly exceeded the death rate. For example, the births for the year 1874 in Winona City numbered 226, while only 130 deaths were recorded. For the county, figures of 1872 show 674 births and 322 deaths. These statistics and the number of incoming settlers are evidence of a community still in its period of rapid growth. New physicians came with the settlers, sometimes five or six in a year.

Several slight epidemics occurred at this time. Early in 1872 whooping cough was prevalent among the children of Winona and vaccination was highly recommended for its prevention. At the same time news came of a smallpox epidemic in the East and of its spreading westward. One physician in Winona City vaccinated 150 persons in a day. This and many other precautions were advised. At the end of the year, only seven deaths from smallpox were reported in Winona, a few at Minnesota City, and none throughout the rest of the county.

Scarlet fever came occasionally in the early seventies, but became more serious in 1876, when twenty-three deaths occurred within a short time in Winona. The disease raged throughout the state during the following year.

Isolated cases of diphtheria were treated from time to time and the disease was reported to be alarming at Saint Charles in November, 1877. There were fourteen fatal cases in Winona the next year, concerning which Dr. Staples wrote in his report to the State Board of Health, "The City of Winona has a population of a little over 12,000 . . . the City has never known an epidemic of diphtheria." Although he mentioned the number of deaths occurring from the disease, such a small percentage was not to be reckoned an epidemic. However, it was considered epidemic elsewhere near Winona. Minneiska and Trempealeau were badly stricken in 1877. In the winter and spring of 1878, thirty cases occurred at Lewiston, a village of three hundred persons. Eleven of these cases proved fatal. In this instance sanitary conditions were known to be poor. Dr. Franklin Staples made a thorough investigation of conditions, continuing it for several years when the epidemic persisted during the eighties. His reports may be found in the records of the State Board of Health, of which he was then a member.

He stated that diphtheria was alarmingly on the increase and that in 1879 more than 13 per cent of deaths in Minnesota occurred from this single cause. Secondly, he emphasized the point that the disease to a great extent was preventable by sanitary means. In November, 1879, a circular inquiry concerning the prevalence of diphtheria in the state from November 1, 1878, to November 1, 1879, was issued to correspondents. One hundred and twenty-nine replies were received. Winona County numbered two deaths from diphtheria among a total of 295 (about $\frac{3}{4}$ per cent as compared to the 13 per cent stated above). Obviously the epidemic did not make much headway at Winona.

The *Scientific American* and other prominent journals quoted liberally from this treatise by Dr. Staples. Staples deserves far more mention than has been accorded him here. He was appointed by the State Board of Health to investigate the effect of the climate of Minnesota on catarrh, pneumonia, and phthisis pulmonalis. He had made studies along this line for some time and the report was published in 1875. During the same year, Dr. Staples made a report before the American Medical Association on "The Influence of Minnesota Climate on Pulmonary Diseases." He was president of the Minnesota State Medical Society in 1871 and always took a very active part in the organization. He was also Vice President of the American Medical Association and without doubt one of the most able physicians of his time in Minnesota.

No record can be found of an adequately equipped hospital in Winona during

HISTORY OF MEDICINE IN MINNESOTA

the seventies or before. It was not until 1894 that the Winona General Hospital was organized under the guidance of Dr. Donald B. Pritchard. A city hospital and pest-house existed at the city of Winona in 1884. It was in charge of Mr. F. Deertz and under the direction of the local board of health. Mr. Deertz' residence, for such was the hospital, was kept up by himself and his family, and it is recorded that only one patient was treated there in 1884. In October, 1885, the city council of Winona received a report by the city attorney relative to the title of lots proposed to be purchased for the city hospital, but no immediate action took place. Curtiss Wedge recounts in his *History of Winona County* that Saint John Hospital conducted by the Sisters of Saint Joseph was the first adequately equipped hospital in Winona. This was discontinued in 1904 but no date can be found of its foundation.

The Homeopathic Medical Society of Southern Minnesota became an active organization during the seventies. Several of the physicians practicing in Winona at this time belonged to the homeopathic school, among them Dr. T. A. Pierce. The fact that there was good natured contention between the two schools is shown in an incident which took place at the 1882 meeting of the Winona Board of Education. There were eight members of the board, and they stood evenly divided. With Drs. J. B. McGaughey and T. A. Pierce as candidates for president, one hundred and thirty-eight ballots were cast, mostly four for one doctor and four for the other doctor, with an occasional varying vote for some other member of the board. It is recorded that after a monotonous session of seven hours, the board adjourned until April 26, when the dogged determination of the friends of their respective candidates continued unabated until 2 o'clock on the following morning. On the 187th ballot, Dr. J. B. McGaughey, the "old school" physician, was elected, his victory finally being recorded as by a unanimous vote. An explanation given by one of the members was that a traitor fled to the enemy. This determined and protracted struggle was not actuated by personal or political feeling, but by the professional pride of adherents of the two candidates who belonged to different schools of medicine. During both sessions of the board when the balloting was in progress, good humor prevailed, and no bitterness of feeling was engendered thereafter.*

During this decade, several new members were taken in to the Winona County Medical Society. Dr. Darwin A. Stewart, who graduated from the College of Physicians and Surgeons of New York City in 1869, was made a member in 1871. Dr. Ferdinand Lessing came in 1875 from Wabasha, and the same year became a member of the society. For several years he held the office of county coroner. In 1876 Dr. Arnold P. Gilmore and Dr. Arthur B. Young, both new arrivals, joined the society. Gilmore was an eye, ear, and throat specialist of high reputation, who had received his training at the Jefferson Medical College. His stay in Winona was brief for he moved to Chicago in 1879. Dr. Young came from Minneapolis in July, 1875, and immediately became a partner of Dr. J. B. McGaughey. Nine years later, Dr. Young left Winona City and took up his abode in Prescott, Wisconsin.

Dr. Henry B. Wedel, who was an organizer of the medical society in 1866, became a member of the Winona County Medical Society in 1879 and was elected president for that year. He arrived in 1862, having recently graduated with distinction from the medical department of the University of Pennsylvania. His career is marked by three years of active surgical work during the war. Not long after his return, he relinquished his practice and became associated with William Netter in the drug business. Twelve years later, he

*This incident is quoted from the "History of Winona County Minnesota" by Curtiss Wedge.

again began to practice and it was about that time that he was elected to membership in the Winona County Medical Society.

Dr. Thomas McDavitt, who graduated from the Chicago Medical College in 1879, was admitted to the society in 1882, and became president the following year. Dr. J. W. Scott, who located at Saint Charles in November, 1882, was almost immediately proposed for membership in the county medical society and was admitted a short time later. He had graduated two years before from the medical department of the University of Wooster. In 1883 Dr. James B. Cole of Minneiska, son of Dr. James M. Cole, and Dr. Thomas W. Sheardown of Stockton, son of Dr. S. B. Sheardown, became members of the medical society. Neither of these young doctors was a permanent resident of Winona County. At the same time, Dr. Wm. A. Chamberlain of Saint Charles became a member. Chamberlain moved to Winona the same year with his wife and infant son.

Drs. C. A. Boyd of Lewiston, Edward D. Keyes, Edson Rhodes, Rudolph C. Teschan of Winona, and Wm. J. Newberry of Minnesota City were made members in 1885.

The obvious limitation of membership and the reputations of the older members speak well for the quality of the society. It was, therefore, a recommendation for the young men to be admitted to membership during those pioneering years.

About 1885 a local medical organization grew up at Winona. It held monthly meetings at the offices of different members, one doctor being appointed essayist for each evening. The presence of Drs. Teschan, Cole, Keyes, Staples, S. B. Sheardown, T. B. Sheardown, McDavitt, McGaughey, Rhodes, and Seilers of Alma is recorded. Judging from the available material, it was a loosely organized, conversational type of society. Several reports, essays, or case histories were read at each meeting and discussion followed. The health of the community was a matter of principal concern among them.

During the last few years with which this essay is concerned, two severe epidemics occurred in the state and surrounding territory, both of which were continuations of those of the preceding decade. The diphtheria epidemic which prevailed in the state during the 1870's continued to take a large toll. Deaths in the state resulting from this disease during the year 1881 numbered 1,397 or 12.12 per cent of the total mortality. It seems scarcely to have touched Winona County until 1885 when an outbreak occurred at Saint Charles. The Saint Charles newspaper correspondent wrote:

"For a long time nothing has created such an excitement in Saint Charles as the diphtheria controversy between the Board of Health and Dr. Burt."

The exact nature of the controversy was not recorded, but it does suggest active concern for the health of the village.

Public schools of Saint Charles were closed in October, and though they opened in November, attendance was greatly reduced. A specimen of water from the well in the school yard was sent to Saint Paul for analysis, and proved to be unusually pure and free from organic matter. However, the sanitary conditions were known to be in need of improvement. During the winter and spring of this year, seven deaths from diphtheria were reported at Winona. No comment from the local health officer has been found.

Statistics show an extremely serious series of smallpox outbreaks throughout the state in the years 1880 to 1885. In 1881 the local board of health at Winona required every person over three months old to be vaccinated, and

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most of the citizens complied with the requirement. The city remained free from the disease during these years. Again in 1885 pressure was brought to bear by the health board, which recommended to the Board of Education that all children attending public schools should furnish evidence of having been successfully vaccinated. The report was tabled, however.

Two or three deaths were reported in the county each year as a result of diphtheria but the disease did not become epidemic. Scarlet fever proved to be a menace during this period, especially to children. Several severe cases were reported at Winona and at Utica in the summer of 1882. Two years later, four deaths were reported among children at Winona. In January, 1885, the disease prevailed at Saint Paul but "not to an alarming degree at Winona." In March, it was recorded that "scarlet fever prevailed in a mild form to a considerable extent at Winona."

Although measles was not reported elsewhere during this period, a severe outbreak appears to have occurred at Dakota village. The following quotation is from "The History of Winona County, Minnesota" published in 1883:

"In May and June, 1882, the village of Dakota was visited by the most severe and alarming sickness that ever struck this healthy little town. Charley Dalton, while on a trip west of St. Paul, caught what was supposed to be the measles. After returning home, he came down very sick. In a few days the whole town became helplessly prostrated. Physicians were called and pronounced it the measles and a slight form of scarlatina. For four weeks every family in town was so stricken that there were not enough well to wait on the sick. . . . The sickness spread to surrounding vicinities, and was very severe in some families. . . ."

Other ills which touched the county at this time included malarial fevers which prevailed around Minnesota City quite extensively in October, 1881, and were thought to be caused by the extreme wet and heat of the summer.

In January, 1883, a neuralgic epidemic, called epizootic, prevailed in Winona and in adjacent Wisconsin towns. The disorder was characterized by severe earache, acute pains in the head, teeth, and face, discharges from the ears and nose, and more or less fever.

Much sickness was reported at Dresbach in the fall of 1883, the details of which remain unrecorded. In the winter of 1884 and 1885, whooping cough was common at Minnesota City. The following August, Saint Charles reported the prevalence of influenza.

The deaths of the county in these five years resulted mainly from non-infectious or non-contagious diseases. Most of the deaths of 1881 resulted from heart disease. A typical report by the Winona City health officer in August, 1883, recorded twenty-two deaths. Six were caused by dysentery, five by diarrhea, one by cholera infantum, two by meningitis; none resulted from contagious diseases. In 1884, also, no epidemic touched the city; the mortality rate was .015 per cent; the population being 16,000 and the number of deaths 237 for the year. It was noted that "a large number of the deaths of young children and most cases of puerperal fever would not have occurred under proper hygienic management."

Local boards of health increased in number in the state about 1885 and became better organized. A conference of state and local boards of health and popular sanitary councils for southeastern Minnesota met in October, 1885. Among those present were Dr. J. W. Scott of Saint Charles, and J. P. Mumford, who was sanitary inspector of Winona though he did not hold a medical degree. Dr. Franklin Staples continued to hold office as health officer of Winona.

These local boards of health were not always composed of physicians, but usually included some outstanding members of the community who would have an interest in the sanitation and well-being of the village.

It is interesting to note that in the year 1885 Winona and other river towns presented a protest through the State Board of Health to the governor to the effect that the time had come for putting an end to defiling the Mississippi River by making it the cesspool of the state. This, however, was ineffective. From that time until now, the State Board of Health has continued its efforts in that direction, and only recently has its protest received proper consideration.

Physicians who came to Winona County in 1886 were Thomas A. Pierce and C. N. Clark. In 1887 F. O. Drake came to Winona from Red Wing and D. C. Lewis from Brooklyn, N. Y., to Saint Charles. H. S. Wahl moved from Minnesota City to Winona; A. H. Trow came from Chatfield to Dakota; and J. Martin left Saint Charles to locate in Little Falls. In July, 1887, there were twenty-two physicians in Winona County.

In November, 1888, a bazaar held for the benefit of Saint Johns Hospital netted almost three thousand dollars, and helped greatly to maintain that institution. In 1890 a considerable sum was raised for the same purpose by a series of ball games among the physicians, dentists, and pharmacists of Winona. The doctors lost all their games. Dr. Sheardown died in 1888. Dr. Donald R. Prichard came to Winona in the same year. During the year 1891 J. W. Timmons came to Winona from Homer, and Royes and J. Wilson to Pickwick. E. D. Stoddard moved to Stewartville, Clark Christian to Witoka, T. R. Wilson to Pickwick, and John Morrison to Winona, from New York, and Dr. English arrived. In 1893 S. C. Vandergee came to Wyattville. Francis F. James to Winona from Tracy in 1894; in the following year W. E. and Louise Aubin became residents of the town. In 1896 Dr. Slocumb and Dr. Steinbach located there. Other physicians who selected Winona as their home were E. S. Muir, N. S. Lane, Oswald Leicht, Francis Roberge, and Engleken, who came in 1898; and J. F. Millsbaugh and O. F. Gile in 1899. Dr. Gile later moved to Dakota. Dr. P. B. Blair arrived in 1900. In the same year Dr. Forger was located at Elba, Dr. Wilmot at Clyde, Dr. Hutchins at Whitehall, and Harvey Brown at Rollingstone.

We have been unable to trace the further history of many of these men. Dr. Louise Aubin, however, moved to Stillwater, while Drs. E. D. Keyes, John Dwight Keyes, H. M. Lichtenstein, Donald B. Prichard, and Charles P. Robbins remained in Winona, Dr. Hiram C. Baer at Saint Charles, and Dr. O. F. Gile at Dakota.

The presidents of the Winona County Medical Society from 1885 to 1900 were as follows:

1885 —Franklin Staples	1891-3—Franklin Staples	1897 —D. B. Prichard
1886 —J. M. Cole	1894 —J. W. Scott	1898 —H. M. Lichtenstein
1887-8—R. C. Teschan	1895 —J. M. Cole	1899 —E. D. Keyes
1889 —S. B. Sheardown	1896 —W. A. Chamberlain	1900 —J. W. Scott
1890 —E. D. Keyes		

J. B. McGaughey was secretary of the society from 1873 to 1908.

A medical organization known as the Winona Medical and Surgical Society met for a time in the early part of 1890. It is stated that the society had existed in name only for a period of two years, and that it was reorganized at this time. Meetings were to be held fortnightly. At the meeting held on February 7, 1890, Dr. McGaughey was elected president, and Dr. McDavitt was chosen secretary. The last meeting of which record has been found was held on February 20, 1890.

(To be continued in the June issue)

President's Letter

THE Committee on Tuberculosis has an ambitious program. It hopes to eradicate tuberculosis from our state—not in general, but completely. The members of the committee believe this can be done.

Three decades ago tuberculosis occupied first place as the cause of death in the United States; today it is seventh. In 1918 there were 2,543 deaths from tuberculosis in our state; in 1938, there were 816, and last year 804, a rate of thirty per hundred thousand.

The factor which encourages the committee to this bold hope is the specificity of the tuberculin test. Bovine tuberculosis was very prevalent up to 1917. In that year testing of cattle by the tuberculin test and the removal of all positive reactors was started. This resulted in a prompt lessening of the incidence of the disease. Post mortems of positive reactors showed tuberculosis in 97 per cent. Today all but six counties in the nation have been accredited. These six counties are in California, which state has been slow to use the test. In England, where the test is not used, bovine tuberculosis is just as prevalent as it was in 1915; and among human beings, 25 per cent of the cases of tuberculous meningitis, 50 per cent of the cases of lupus, 20 per cent of the cases of tuberculosis of the bones and joints, and even 3 per cent of the cases of pulmonary tuberculosis are of the bovine type.

The plans of the Committee are not fully formulated but in general will consist of the following:

1. Apply the tuberculin test to the entire personnel of each household in every county.
2. Make a radiographic study of every positive reactor.
3. Make additional laboratory and medical examination to complete the diagnosis.
4. Provide adequate segregation and treatment for each patient as long as he is infectious.

A more economical plan would be as follows:

1. Concentrate x-ray studies particularly on the tuberculin sensitive adults present in each home in which tuberculin sensitive children are found.
2. Radiograph adults who are positive reactors and whose children have negative reactions to tuberculosis.
3. Reapply a tuberculin test to all future members of population and all who were negative on previous survey at least annually.
4. Concentrate x-ray studies particularly on tuberculin sensitive adults in each home in which tuberculin sensitive children are found, and repeat them at least annually.

To be effective, it will require the coöperation of every physician in the state. A statewide program of education must be carried out efficiently. It will be necessary to raise funds for filming, hospitalization of active cases, and for follow-up work.

This is a large program which must be continued for many years. Such diseases as diphtheria, smallpox, typhoid, yellow fever have been brought under control by medical science. Considering the long course of the disease, its universal and continuous incidence, and the economic and social loss caused, tuberculosis has been a far more serious disease. If the White Plague can be eradicated, it will be the greatest feat ever accomplished by medical science.

BERTRAM S. ADAMS, President

Minnesota State Medical Association.

EDITORIAL

MINNESOTA MEDICINE

OFFICIAL JOURNAL OF THE MINNESOTA STATE MEDICAL
ASSOCIATION

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and Publishing Committee

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BUSINESS MANAGER

J. R. BRUCE

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STATE MEETING—1940

THE annual State Medical Association meet-
ing at Rochester last month fully satisfied
expectations, both as to attendance and scientific
program. This meeting has come to be one of
the largest annual meetings in this part of the
country. Some 3,400 registrations included
about 2,000 physicians from Minnesota and sur-
rounding states.

The new Rochester auditorium, which was
used for the first time for a medical meeting,
proved ideal, for the acoustics of the amphi-
theater obviated any need for a loud speaker and
the adjoining rooms well accommodated the
scientific and commercial exhibits.

Officers chosen by the House of Delegates
included Dr. B. J. Branton, Willmar, president;

Dr. Albert Fritsche, New Ulm, vice president;
Dr. Frank J. Heck, Rochester, second vice presi-
dent; Dr. Benjamin B. Souster, Saint Paul, Sec-
retary (re-elected); Dr. W. H. Condit, Minne-
apolis, treasurer (re-elected). Dr. W. W. Will,
Bertha, and Dr. E. A. Meyerding, Saint Paul,
were re-elected speaker and vice speaker, respec-
tively, of the House of Delegates. Dr. W. A.
Coventry, Duluth, and Dr. W. F. Braasch,
Rochester, were re-elected A.M.A. delegates,
with Dr. J. C. Hultkrans, Minneapolis, and Dr.
W. L. Burnap, Fergus Falls, re-elected alter-
nates. Dr. Carl M. Johnson, Dawson, was elected
councilor of the Third District to replace Dr.
B. J. Branton.

Dr. Henry Ulrich, Minneapolis, was elected
by the Editing and Publishing Committee of
MINNESOTA MEDICINE as Associate Editor of
the journal to take the place left vacant by Dr.
Gilbert Cottam.

The full capacity of the dining room at the
Rochester State Hospital was taxed by some 465
members, wives and guests at the banquet Tues-
day evening. Unfortunately many were unable
to obtain tickets. Following the banquet the
diners were addressed by Governor Stassen who
spoke in his characteristically forceful manner
on fundamentals and trends in government and
announced his intention of appointing in the near
future a commission to draw up a suitable
memorial to those two outstanding Minnesota
surgeons, Drs. William J. and Charles H. Mayo.
The address of Mr. Bernard H. Ridder, pub-
lisher of the *Saint Paul Pioneer Press and Dis-
patch*, on Hitler proved particularly interesting
because of his personal acquaintances with the
Führer.

The prize presented each year by the Southern
Minnesota Medical Association for the best
scientific exhibit at the State meeting was this
year awarded to Dr. Carl W. Waldron, Minne-
apolis, for his exhibit of Fractures of the Facial
Bones. Honorable mention was given Harry
Wilmer of the Department of Pathology at the
University of Minnesota Medical School for his
exhibit of Injected Kidneys.

Saint Paul was chosen as the place of meeting
for 1941.

SCUTTling THE EPONYMS

EVER since medicine in all its branches really began to advance it has become increasingly evident that something would have to be done about the various nomenclatures. These had simply accumulated, from the earliest times, without any semblance of order or system. Anatomic structures, pathologic conditions, clinical symptoms, methods of diagnosis, diseases, surgical instruments, surgical operation, et cetera, were often given the names of those who had discovered or first described them, without any other indication of their nature or function. It was a pretty custom and wholly unobjectionable in the days of vague medical knowledge, when sentiment and a desire to pay tribute to great names had been in the ascendent over a long period of time, but it was totally out of step with the trends of modern times, in which not only are precise facts the basis of all scientific progress but accurate terminology predicated on orderly planning are equally essential.

Strangely enough the first serious effort to correct this situation came in the field of anatomy. The Anatomische Gesellschaft, the leading society of anatomists in Germany, held numerous conferences about fifty years ago and at its ninth formal meeting in Basel, Switzerland, on April 19, 1895, adopted what is known as the BNA (Basel Nomina Anatomica) in which all eponyms had been dropped and all structures given Latin names which either described their appearance or connote their functions. It is, today, the foundation of all modern works on anatomy, although modifications, without disturbance of the basic principles, are still in course of discussion. Thus there is the NK (Nomenklatur Kommission), the British Nomenclature, in Latin and English and, finally, the International Commission to assemble and correlate all available data, the latter still in existence.

In bacteriology many difficulties arose. Some years ago a committee of the Society of American Bacteriologists spent several years in formulating a scheme of classification and nomenclature of bacterial types, which has been fairly generally accepted, in this country at least, as best meeting the varied and difficult requirements of the situation. The classification extends from

order to family and subfamily, tribe and genus, before the individual microorganism is reached. The eponymic motif has been preserved in part and turns up now and again even as high up in the family tree as in the tribe (e.g. *Neisseriae*) and quite often in the genera (*Gaffkye*, *Salmonella*, *Pfeifferella*, *Pasteurella*, et cetera) and finally in the individual, as in *Clostridium welchii*, although in this instance the more familiar *B. welchii* is still in common use.

The designation of surgical operations by the names of their originators, or modifiers, has long been a source of confusion and error. To obviate this and many other weaknesses the Western Surgical Association appointed a Committee on Names of Surgical Operations more than ten years ago, composed of E. Starr Judd, Kellogg Speed, Harry P. Ritchie and Carl E. Black. Like similar efforts in other fields it proved to be an enormous task, lightened only in some degree by material help from the American Medical Association and by the tireless coöperation of several national surgical organizations and many individuals in this country and abroad. The final result was published in 1935 in a book of 100 pages entitled *Names of Surgical Operations*, a model of simplicity and clarity and without the use of a single eponym.

Lastly, but by no means the least, come two monumental works which are the products of enormous and effective labor and scientific judgment. These are the *Standard Classified Nomenclature of Disease*, published in 1935 and subject to revision every five years and the *Manual of the International List of Causes of Death*, revised every ten years, now in its fifth revision. It is sincerely to be hoped that these two nomenclatures will ultimately come into universal use wherever scientific medicine is practiced.

The eponyms have gone for good. No longer may we speak of Bright's disease, Scarpa's triangle or the Billroth I and II. Sentimentally we are poorer but scientifically far richer by the change, for now we have accuracy and uniformity at our behest and no one who is imbued with the real spirit of progress will have any regrets. A tremendous advance has taken place.

GILBERT COTTAM.

DR. GILBERT COTTAM

IT IS with regret that we announce the loss of the services of Dr. Gilbert Cottam as associate editor of the journal, because of his return to Sioux Falls. His numerous efforts in behalf of the journal and his contribution of numerous editorials since November, 1937, when he became an associate editor, have been greatly appreciated.

Dr. Cottam left Sioux Falls, South Dakota, some twelve years ago. After a brief sojourn in Saint Paul where he was a member of the Ramsey County Medical Society in 1931, he moved to Minneapolis where he took an active interest in the affairs of the Hennepin County Medical Society. He was editor of the *Hennepin County Bulletin* from 1935 until January of this year and gave generously of his time and literary talent to this publication.

A complimentary farewell dinner was given Dr. Cottam at the Minneapolis Club, April 16, by some sixty professional friends. Dr. George Dunn presided and brief speeches were made by two teams of guests headed by Dr. A. E. Benjamin and Dr. W. A. Hanson, the team headed by Dr. Benjamin being instructed to make only complimentary remarks about the guest of honor and the second team just the opposite. Needless to say the first team was awarded the victory by the committee headed by Dr. Olga Hanson.

During Dr. Cottam's comparatively brief residence in Minneapolis he was very active professionally and made a great many friends, whose best wishes he carries with him to Sioux Falls.

HEALTH FOR LABOR

The American Labor Party is trying to win workers over to its health program by means of a bulletin issued periodically under the auspices of its Committee of Medical and Allied Professions. The Party appears determined to present the medical issues of the day fairly and to demand a square deal for the healing professions under whatever program is ultimately adopted. Unfortunately, its medical policies, as set forth in "Health Security Bulletin," appear to have been shaped by the more radical elements of which it is seeking to purge itself. Insistence on compulsory health insurance at this time, when medical and lay opinion are united on the merits of voluntary non-profit medical expense indemnity insurance, is likely to sabotage the development of a harmonious progressive health program. Needless to say, this would cause satisfaction among Communists in and out of the A.L.P.

Except for the issue of compulsory insurance, there is no vital disagreement between the health programs of organized medicine and of the American Labor Party. Both favor state medical aid for the indigent and medically indigent. Both want the maintenance of the traditional doctor-patient relationship and professional participation in the administration of health plans.

The advocates of compulsory sickness insurance, in the American Labor Party as elsewhere, try to confuse the issue by arguing that voluntary insurance would not provide for all who need medical aid. This is true—but neither would compulsory insurance. The insurance principle—whether on a voluntary or compulsory basis—is applicable only to those employed at salaries large enough to permit the payment of premiums without serious deprivation. The unemployed and workers earning mere subsistence wages must receive state help. It is folly, in the name of health, to deprive small wage-earners of health essentials by levying a weekly tax on their already inadequate earnings. The unemployed do not come within the purview of compulsory insurance any more than voluntary.

The "Health Security Bulletin" of the American Labor Party argues that since voluntary insurance almost always leads to compulsory, we might just as well start with the latter. On the contrary, this seems to us another reason for not insisting on compulsory insurance until voluntary schemes have had their chance. If voluntary insurance works out, without the creation of a vast parasitical political bureaucracy, it will be to the advantage of the working class which, in the long run, pays the costs of government. If it fails, the profession will have less reason to oppose compulsory schemes and many valuable administrative lessons will have been learned.

The American Labor Party must realize that the welfare of the working classes is indispensable to the medical profession; the vast majority of physicians have their practice among the poor and middle class. Since medicine and the American Labor Party are united on many of their health aims, would it not be a constructive step for the A.L.P. to postpone its campaign for compulsory insurance, pending the results of voluntary medical expense indemnity, and cooperate with the profession for the enactment of measures on which they are agreed? —Editorial, *New York State Journal of Medicine*, Feb. 1, 1940.

DIAGNOSIS OF TUBERCULOSIS

The modern concept of diagnosis of pulmonary tuberculosis implies a decision as to whether or not the patient has a pulmonary tuberculous lesion; whether the lesion is healed, inactive, or active and an attempt to determine to what phase the lesion belongs, whether primary or in the stage of dissemination. Even the total absence of physical signs does not exclude the presence of a tuberculous lesion, healed or active. Advanced disease may be diagnosed by physical examinations but they cannot be relied upon for the diagnosis of progressive early disease.—P. O. KAYNE, M.D., *Pulmonary Tuberculosis*, Oxford Med. Publication, 1939.

MINNESOTA MEDICINE

MEDICAL ECONOMICS

Edited by the Committee on Medical Economics
of the

Minnesota State Medical Association

W. F. Braasch, M.D., Chairman

IS GROUP PRACTICE THE SOLUTION?

Critics of the present methods of medical practice confine most of their efforts to publicizing and magnifying its deficiencies. It is being done by a continuous barrage from social reformers, medical radicals, sensational journalists and New Dealers. As a result, a section of the public is being led to discredit the medical profession and its methods of practice and to believe that there is urgent need of reform. No one is more aware of the deficiencies in the present methods of distributing medical care than the doctor himself. The trouble has been to discover the best means of overcoming the faults without serious injury to the best system of medical care that has as yet been devised. The physician, through organized medicine, has hesitated to make any radical changes for fear of unbalancing the whole structure of medical practice. He has preferred to carefully try out various plans for improvement based on practical experience. Not so the social reformer and uplifter. He does not hesitate to advocate any of a score of plans which are either based on little or no experience or which have governmental support.

"The Mountain Labored"

The main objection to the present methods of medical practice, from the public viewpoint, is, of course, its cost. Medicine cannot be made cheap without having cheap medicine. In case of a medical catastrophe the cost to a family which cannot take care of it becomes a calamity. It is for the solution of such problems that organized medicine is trying out a system of voluntary insurance at a rate which can be met by any non-indigent individual. This plan retains the advantage of a choice of physicians and personal relationship, as well as the stimulus for individual initiative.

Regrettable to say, some of the magazine ar-

ticles antagonistic to organized medicine are written by physicians themselves. In one such article not alone are the conscientious efforts on the part of organized medicine to solve their problems belittled, but, after smearing the medical profession in general, the author questions the ability of his colleagues to care for the sick as individuals. After all this, what was the solution that he offered? The mountain labored and produced a mouse-like solution: namely, Group Medicine.

Group Medicine Advocated

Group Medicine as a solution of the problems affecting medical practice was first recommended by the Majority Report of the Committee on the Cost of Medical Care, and since then has been advocated by many others. It is asserted in the recent article referred to that it would overcome many of the present difficulties involving medical practice, including the evils resulting from professional competition and such problems as the predicament of the recent graduate without sufficient practice to keep him busy. The formation of group clinics to take care of all medical practice is suggested. Even if it were possible, what a wierd form of medical practice we should have if such clinical groups thickly dotted the land. It is certainly open to question whether group practice can be adapted to meet many of the situations met with in the actual practice of medicine. While it may offer certain advantages in urban centers, it would not function so well in rural districts.

No statement is made as to how these groups are to be formed, financed, and given the various facilities which are necessary to success. It is not stated whether they are to be aided by or under government control. The impression is given that successful clinical groups can be formed out of thin air. It is apparently forgotten that

numerous attempts have been made to form clinical groups in the past and that only a very few have survived. It is generally admitted that the successful formation of a group depends upon several factors, including a strong executive at the head, a nucleus of wide clinical opportunities, and exceptional professional ability on the part of the promoters. Many a group has been formed with adequate possibilities, only to be wrecked by professional jealousy, the very objective which group practice is supposed to overcome. It could readily be imagined what would happen to any group which would be formed under durance of governmental control.

Professional Coöperation Valuable

The value of professional coöperation is fully realized by groups of independent physicians situated in urban centers, where many loose associations of this type have been formed. A working arrangement is effected whereby the patient can be examined as indicated by various specialists situated in the same office building. Financial arrangements are made so that the cost can be met according to the income of the patient. This system has had widespread adoption and has worked out very well, in a measure taking the place of a clinic. Clinical groups, however, are in existence which do not function as ideally as pictured and which have no other purpose than commercial gain. It is true that the monthly charge of some of these clinics is comparatively low and on the surface it seems surprising how much can be offered for the money spent. Closer inspection, however, will show that the standards of diagnosis and treatment offered cannot be regarded as "good" medicine. The profits in clinics of this type are often made by extra charges and by the commercial adjuncts of the clinic.

No clinical group can practice good scientific medicine by materially lowering the cost to the patient. It has been asserted that the American Medical Association is opposed to group medicine. This is quite contrary to the truth. The American Medical Association is opposed only to that type of clinical group that does not practice good ethical medicine.

Other Methods Available

It is true that the ability of the men involved is increased by closer association and by in-

creased clinical opportunities. Nevertheless, there are other methods than group medicine to accomplish this purpose among the rank and file of medical men. It is remarkable that after years of thought and investigation by social reformers and the expenditure of a large amount of money by Foundations and even by federal sources for the purpose of reform, no better solution can be advocated to solve the problems of medical practice than Group Medicine.—W.F.B.

PHYSICIANS TAKE THE PLATFORM

It is clear from the multitude of requests for speaking material that doctors are at last alive to the necessity for telling the people how the profession of medicine feels about encroachment of government into the American system of care for the sick.

Response to a recent country-wide questionnaire showed that 98 per cent of the medical men of the country were opposed to socialized medicine. The results received widespread publicity and the people who read about it are certainly justified in wanting to know why.

They have been told repeatedly that the physicians of the country back the American Medical Association in its opposition to the Wagner Health bill and compulsory sickness insurance. Many earnest men and women honestly see in these measures a welcome method for preventing sickness and saving lives. If the doctors see something else besides in such measures, just what is it the doctors see?

It is too much to expect that the general public will accept the unsupported word of the doctor in matters like these. Outside the consulting room the physician must be as explicit in defense of his opinions on public matters as the politician—and far more persuasive.

An Excellent Sign

It is, therefore, an excellent sign that doctors are accepting so many invitations to talk about the national health program and its corollaries.

Quoted below for their assistance are excerpts from recent talks by Dr. W. A. O'Brien, Minnesota State Medical Association radio speaker and director of post-graduate medical education at the University of Minnesota, who is one of the most skillful and effective speakers in the entire country.

No Depression in Medicine

Said Dr. O'Brien:

"There has been no depression in medical progress since 1920. No period in history has seen so much progress in the prevention and cure of illness.

"Just think, for a minute, of what this phenomenal progress has meant. Before 1920, we had no insulin and diabetics—even diabetic children, were doomed to slow starvation or death in coma.

"We had no liver extract for pernicious anemia. We didn't know how to use iron for the anemia that used to be so common among young girls.

"We had no idea how to control hook worm disease.

"We knew nothing about the vitamins that have so changed our concepts of diet, nothing about nicotinic acid which performs miracles for victims of pellagra nor for the other synthesized fractions of Vitamin B which are offering new hope for so many otherwise hopeless ailments.

"We knew nothing about sulfanilamide or sulfapyridine or any of the related chemical compounds that have revolutionized our treatment of streptococcal infections, of gonorrhea, of pneumonia. Before we had sulfanilamide, for instance, we never had one single treatment that was of any real value for the blood poisoning of women following childbirth.

"Before 1920—"

"Before 1920, we had none of the new anesthetics that have made surgery safe for so many people who were deprived of it in the old days. We knew nothing about modern preparations for operation and nothing about the use of blood transfusions to combat the hazards of surgical treatment. Nothing about the measures that now make it possible, if necessary, to prolong delicate life-saving operations to nine and ten hours without harm to the general condition of the patient.

"We knew nothing about modern care for premature babies by which death rates for babies born too soon was cut in one of our Minnesota hospitals from 65 to 10 per cent in the last four years.

"What does all this mean to us?

Longer Life for All of Us

"It means longer and better life for everybody, of course. But it also means that there are more old people in the population in comparison to the young. It means, among other things, that arthritis is the most common of all diseases today, that allergies are increasing rapidly, that circulatory diseases and heart disease and cancer are taking the place in numerical importance of the old scourges of youth.

"It means, in spite of all that has been done in medicine in the last 20 years, that there is now a great unrest about medicine itself. Why? Because the aging section of the population is fearful and uneasy. It demands its ham and eggs and its thirty dollars every Thursday. It yearns, also, for free medicine—and the propagandist is quick to seize on that yearning.

"Security is the watch-word these days. But here is a curious and ironic fact; when we try to hand people security we defeat our own purpose. The truth is that we cannot give people real security. The only things that benefit any of us in the long run are the things that we get for ourselves.

Jittery Souls

"Did you ever notice the people who live on pensions or who hope to live on pensions? They are the most jittery souls on earth. They worry for fear they will not live long enough to enjoy their pensions and then they worry for fear the pensions will be taken away.

"We doctors know that, and we believe that in some things, such as illness, the people must be responsible for themselves. And, above all, that government cannot step in successfully and take that responsibility for us.

The Worse for All

"We believe that people should never be forced to go to doctors if they don't want to nor should they even be vaccinated and immunized against their will. If government does step in, assume that responsibility and enforce those measures, we believe it will be the worse for the patient and the worse also for medical progress.

"Of course, there are some special fields such as tuberculosis and mental disease in which we have welcomed government assistance. We know that government also serves an essential function in the control of public health.

A Different Story

"The story is entirely different, however, for the ordinary illness of the ordinary person. For these illnesses and for their own health, the responsibility belongs to the people themselves. And if the insurance principle should prove to be practical for payment of medical costs, then in these plans too the people should help themselves. We are already showing that it can be done in our hospital service associations and in our college health services. Certainly there is no reason why we should abandon the principle of self help simply because as a nation we are older than we used to be and are therefore subject to the fears and distresses of age.

Unselfishness for Age

"Perhaps the most important thing for any of us to learn is how to grow old gracefully. Courage and optimism and unselfishness are attributes of youth but they can be cultivated in age, as well.

"We must cultivate them in America if we are to avoid the unhappy consequences of our fears and especially if we are to keep the way open to medical progress in the United States."

REGULATING VITAMINS

Last week, the Food and Drug Administration got around to the vitamin industry.

Tentative regulations were set up covering vitamins from A to K and, if they go through, they are expected by *Business Week* to pare down the biggest slice of the fat vitamin pie—that is, the sales from the long-established and eminently marketable vitamin D, the “sunshine vitamin.” Hearings were scheduled for April 29.

The portion which is going to cause the major part of the shouting comes in one sentence requiring flatly that the labels of all foods making Vitamin D claims carry the statement: “When the skin is adequately exposed to direct sunshine, there is no established need for Vitamin D in the diet.”

Other telling points in the new regulations are:

1. All dietary foods, regular foods fortified with vitamins or minerals and so-called pharmaceutical concentrates, both of which come under the guns of the new regulations, must state on the label the dietary properties on which their claims are based.

2. Labels must tell whether recommended daily dose or serving comes up to the minimum vitamin requirements set up by the FDA.

3. If claims are based on a vitamin or mineral not yet established as necessary to human nutrition, labels must make this clear.

American Cult

Says *Business Week*:

“Whatever the outcome of the hearing set for April 29, FDA has bitten off a very sizable hunk to chew. In the past ten years, there has grown up in America what amounts to a vitamin cult, with its worshippers ranging from the Park Avenue socialite who pays her doctor \$25.00 a visit to find out that she has a B deficiency to the Montana cowboy who orders a package of capsules from Sears Roebuck or Montgomery Ward. Today, a good sized drug store stocks around 500 separate vitamin products. . . .

“Supplying the country with its A B C’s is an industry as complex as the vitamins it sells. A complete picture would include almost every big pharmaceutical house in the country, a fat slice of the food and cosmetic industries and any number of assorted concerns which manage to tie their advertising and promotion to the vitamin fad. Behind these are the companies which supply vitamins in bulk to the drug, food and cosmetic industries.

Millions for Vitamins

“Just how big the sales of vitamin concentrates and vitamin-impregnated foods are annually is not known.

A fair estimate, however, is that drug stores marketed \$56,000,000 worth of vitamin products last year. Sales of vitamin-impregnated foods probably pass that estimate. Vitamin concentrates and vitaminized cosmetics also move across department stores and are distributed by mail. And that does not take into consideration the tremendous sales of vitaminized food for animals and plants. Practically every chick in the country gets its ration of Vitamin D and Vitamin B tablets are on the market for the well-cared for garden.

Merck’s Acid of Life

“Some idea of the rapidity with which vitamins have forged ahead and of the complexity of the business the FDA is trying to regulate may be gathered from the fact that no less than five vitamins or factors of vitamins have been discovered or synthesized within the past few weeks. At least one of these, pantothenic acid, one of the mighty B complex, popularly known as ‘acid of life,’ has first class commercial possibilities. Option on the new vitamin is held by Merck whose chemists cooperated with Dr. R. J. Williams (brother of Bell Telephone Williams) in synthesizing it.”

Perles and Vitawater

The Vitamin Beverage Corporation is a new contender whose advertising for vitaminized Ginger Ale and Vitawater is just breaking in the national magazines. Incidentally, the head of this new corporation is also behind the U. S. Vitamin Corporations which sell Vi-Syneral to doctors and also the Dietetic Research Laboratories which sell vitamin and mineral “perles” on a “beauty-through-health” basis.

Seven Takers for “Health Insurance”

Most interesting of all, perhaps, is the brand new “health insurance” that the U. S. Vitamin Corporation is promoting in order to sell its Vi-Syneral in bulk to big corporations.

The idea is that employees are to get their vitamins in wholesale lots, employers and employees splitting the cost after the Social Security pattern. So far, says *Business Week*, James Burns, head of the corporations, claims seven takers for the idea. And it appears also that U. S. Vitamin may expand still further if a vitamin-hormone product under their option which is now being tested in the Paris laboratory of Dr. Casimir Funk, is successful.

Still left to the FDA to consider are the vitaminized cosmetics which do not as yet come under their jurisdiction.

Actually, most of the big names in the vitamin business admit that when all of the tumult and

shouting and expense of revamping labels and formulæ are over, they will be glad the FDA stepped in.

AMA Is Only Check

The vitamin industry has not been notably successful in regulating itself and the more ethical producers have shuddered at practices which threatened to discredit good and bad alike. What small measure of control there has been has been exercised by the American Medical Association which has consistently opposed wholesale fortification of foods, drugs, and cosmetics, pointing out that the average adult gets all the vitamins he needs from a well-balanced diet and that cases of real deficiency are subjects for a doctor's care.

INTERESTING STATISTICS

(Monthly Editorial Prepared by the Medical Advisory Committee)

A perusal of the malpractice cases brought against members of our Association during the last year and reviewed by the Medical Advisory Committee develop some interesting statistics.

Number one in the list of complaints is the fracture cases. Thirty-three per cent were brought as the alleged result of improper diagnosis and improper or poor treatment.

Your Committee recommends that the State Fracture Committee and the component county societies stress the matter of fracture treatment to the fullest during the coming year. There should be no let down in the study of this most dangerous of all fields from a medico-legal standpoint.

Number two is the complications of some forms of dermatitis. The misuse of the x-ray and other modes of applying light rays are the complaint.

Dermatological conditions are first seen by the general practitioner as a rule. If complications arise and the use of x-ray therapy is necessary, only those fully versed in its use should apply it. It is a dangerous instrument in unskilled hands.

Number three is the complications following tonsillectomies alleged to have been improperly performed causing loss of voice and so forth.

Tonsillectomy has become an every-day feat performed by the skilled and the unskilled. Ant-

icipated results are only obtained by close attention to the details of pre-tonsillectomy and post-tonsillectomy treatment, as well as a knowledge of the anatomy involved and proficiency in surgical performance.

Number four is the complications following intravenous and intradermal injections of various drugs: Neosalvarsan, "cold shots," varicose vein injections and so forth.

These have been unusually numerous this last year. This manner of treatment should not be considered lightly. Large amounts have been asked in damages in these cases.

Number five shows a miscellaneous number of other alleged wrongs committed by the medical man, for example: Negligent examination, improper talking, sponge left in wound, hernia following appendectomy.

This group shows the pitfalls of the general practice of medicine. Every case is a potential suit. Proper care of the patient by meticulous attention to details will avoid most of these. Again, we bring to the membership's attention, the curse of the unbridled tongue when discussing another man's work.

—B.J.B.

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

Julian F. Dubois, M.D., Secretary

Quack Doctor Pays \$500.00 Fine in Minneapolis

Re: State of Minnesota vs. William E. McCoy (2 cases).

On April 1, 1940, William E. McCoy, 35 years of age, and who holds no license to practice any form of healing in the State of Minnesota, pleaded guilty in the District Court of Hennepin County, to an information charging him with the crime of practicing healing without a basic science certificate. McCoy was fined \$500.00 by Judge W. W. Bardwell and which fine was immediately paid by the defendant. McCoy, on the same date, entered a plea of guilty to an information charging him with performing a criminal abortion on a 35-year-old divorced Minneapolis woman. On this charge, Judge Bardwell sentenced McCoy to a term of 4 years in the State Reformatory at St. Cloud, and the execution of this sentence was stayed for 3 years, upon condition that the defendant refrain from practicing healing in any manner in the State of Minnesota, and that he also refrain from engaging in any abortion activities. The complaint charging McCoy with practicing healing illegally, was filed by Mr. Brist on behalf of the Minnesota State Board of Medical Examiners, and was based on McCoy's maintaining an office for the practice of healing at 316 Masonic Temple Building, Minneapolis.

McCoy told the Court that he resided at 594 Ashland Avenue, St. Paul; he stated that he had no medical training of any kind, but got into the perform-

ing of criminal abortions through the National Health Service Bureau which McCoy formerly operated at 1591 University Avenue, St. Paul. McCoy, at that time, was engaged in the sale of a medicinal preparation at \$5.00 per bottle, which was advertised as being beneficial in cases of delayed menstruation. Apparently, the preparation was a failure for McCoy stated that he was soon engaged in the performing of criminal abortions. McCoy was arrested by the St. Paul Police Department in February, 1939, in connection with his operation of the National Health Service Bureau and finally was permitted to plead guilty to a violation of the State Pharmacy Law, for which he was fined \$50.00. In the present cases, McCoy was arrested in his office by members of the Minneapolis Police Department, on March 14, 1940, at which time his complete stock of surgical instruments and various medicinal preparations were confiscated. The Minnesota State Board of Medical Examiners approves of the manner in which the present cases were disposed of by the Court. Judge Bardwell made it very plain to the defendant that the Court was not imposing any fines in his case in the future, but that any unlawful activities on the defendant's part would result in a trip to the St. Cloud Reformatory. McCoy stated to the Court that he was absolutely finished with any such activities, and he will have no one to blame but himself if he is obliged to serve a prison term at St. Cloud. The Medical Board also wishes to acknowledge the splendid work done in these cases, and the cooperation given by the Minneapolis Police Department, and particularly by Lieutenant Blanche Jones and Mrs. Carrie Bystrom of the Women's Bureau.

* * *

Supreme Court Affirms Conviction of Minneapolis Physician

Re: State of Minnesota vs. George Frederick Lemke.

On January 26, 1940, the Supreme Court of Minnesota affirmed the District Court of Hennepin County in denying the defendant a new trial. The defendant was a duly licensed physician and surgeon in the State of Minnesota, until his license was revoked by the Minnesota State Board of Medical Examiners on February 11, 1939, for immoral, dishonorable and unprofessional conduct. Dr. Lemke was found guilty by the Medical Board of procuring, aiding and abetting a criminal abortion on a twenty-two-year-old Saint Paul girl. The girl was found dead in Dr. Lemke's office at 512 Pence Building, Minneapolis, on December 10, 1938. On February 25, 1939, Dr. Lemke was found guilty by a jury of the District Court of Hennepin County, of manslaughter in the first degree growing out of this case. He was sentenced by the Honorable W. W. Bardwell, Judge of the District Court, to a term of not less than five, and not more than twenty years at hard labor in a state penal institution. On May 17, 1939, Judge Bardwell denied Dr. Lemke's motion for a new trial, following which Dr. Lemke appealed to the Supreme Court of Minnesota. Following the Supreme Court's affirmation of the order of the District Court Dr. Lemke filed a petition for a rehearing, which was denied by the Supreme Court on February 28, 1940. Dr. Lemke was received at the State Reformatory at St. Cloud on March 1, 1940, to begin his sentence.

Dr. Lemke was born in Saint Paul, June 29, 1879, and graduated from the College of Physicians and Surgeons in Baltimore, Maryland, in 1906. He was licensed in Minnesota on June 26, 1908, by reciprocity with the State of New Jersey. Dr. Lemke was also licensed to practice medicine in the State of New York in 1907.

WOMEN'S AUXILIARY

MRS. A. C. BAKER, Fergus Falls, *President*
MRS. E. V. GOLTZ, 2259 Summit Avenue,
Saint Paul, *Publicity Chairman*

Ramsey County

On March 25, the Ramsey County Medical Auxiliary held a regular meeting at the home of Mrs. John A. Moga, 948 Portland Avenue, Saint Paul. Miss Roselle Bezarian, pianist of the Summit School Music Department, played a program arranged by Mrs. G. Douglas Brand. Mrs. John J. Ryan, hospitality chairman, arranged the tea which followed. Mrs. Eugene Scott and Mrs. C. Harry Ghent poured.

The Auxiliary gave a Public Relations tea on Tuesday, April 2, in the Ramsey County Medical library in the Lowry Medical Arts Building. The presidents and secretaries of all women's organizations of Saint Paul were invited, in addition to the guests invited by the members of the Auxiliary. About 550 women were present.

Mrs. G. Douglas Brand arranged the program which included an address by Dr. William A. O'Brien, Associate Professor of Pathology and Public Health at the University of Minnesota, and the reading of the Broadway comedy "What a Life" by Mrs. Donald Bacon, a member of the Auxiliary. The following members assisted Mrs. Brand with arrangements: Mmes. John J. Ryan, E. V. Goltz, Lloyd Dack, Gordon R. Kamman, J. R. Aurelius, Bernard O'Reilly, and Mrs. C. Harry Ghent, president of the auxiliary.

Pouring tea were the former presidents: Mmes. Harry P. Ritchie, E. C. Eshelby, and William H. Hengstler.

* * *

A Last Reminder

Make your reservations now, for the 18th Annual Convention of the Women's Auxiliary to the American Medical Association to be held at the Hotel Pennsylvania, New York City, N. Y., June 10 to 14. New York has much to offer aside from the convention and you will not want to miss the opportunity of visiting New York this year.

* * *

CLIMATE IN TUBERCULOSIS TREATMENT

There are various conceptions as to what constitutes an ideal climate for the treatment of tuberculosis, but several authorities agree that certain climates are beneficial only to the extent that they permit patients to spend a maximum number of hours comfortably out of doors. A regimen of regulated rest and exercise, proper food and open-air life is considered to be the fundamental essential in the treatment of tuberculosis, and the part played by climate is believed to be subservient to the other more important considerations. Moriyama, I. M. and Herrington, L. P., *Amer. Rev. of Tuberc.*, March, 1939.

◆ OF GENERAL INTEREST ◆

Dr. Max Alberts of Saint Paul is chairman of the Minnesota State Medical Association cancer committee.

* * *

Dr. Herbert A. Carlson, formerly at Ah-Gwah-Ching, Minn., has gone to Minot, N. D., to practice.

* * *

Dr. Thomas E. Eyres of Pequot has recently moved into new office quarters where he has installed new x-ray equipment.

* * *

Dr. and Mrs. W. F. Nordman of Mora have returned from New York City, where Dr. Nordman recently completed a postgraduate course in medicine.

* * *

Dr. J. F. Karn, resident physician at Midway Hospital, has taken over the practice of the late Dr. T. J. Moynihan of Saint Paul, with offices at 2395 University Avenue.

* * *

A. TerLouw of Rochester, N. Y., addressed the University of Minnesota Hospitals general staff meeting, April 12, on the subject of medical movies, and the photographing of records.

* * *

Dr. H. T. Karsner, professor of pathology at Western Reserve University, will speak at the Mayo Clinic, May 23, on "The Relation of Certain Ovarian Tumors to Endocrine Disturbances."

* * *

Dr. Ellet de Berry, mental hygienist at the University Health Service, resigned several months ago to go to Sonora, Texas, where he is making his home on a ranch.

* * *

Dr. Owen H. Wangenstein, head of the University of Minnesota department of surgery, addressed a meeting of the Tacoma (Wash.) Surgery Society, March 23, on "Etiology of Acute Appendicitis."

* * *

Dr. Eva Jane Ostergren, who received her M.D. from the University of Minnesota in 1939, has become associated with her father Dr. E. W. Ostergren, in practice in Saint Paul.

* * *

Dr. Richard E. Scammon, long-to-be-remembered for his anatomy courses at the University of Minnesota, is now teaching two other courses in the Medical School: Measurement in Medicine and Medical Biography.

* * *

Dr. A. D. Prangen of Rochester delivered three lectures for the post-graduate course in ophthalmology at the George Washington University School of Medicine in Washington, D. C., in March. He also addressed the Washington Ophthalmological Society on "Some Salient Factors in Surgical Treatment of the Ocular Muscles."

Dr. Milan V. Novak resigned as instructor in bacteriology at the University of Minnesota Medical School, April 15, to go to Chicago as assistant professor of bacteriology at the University of Illinois College of Medicine.

* * *

Dr. R. V. Sherman, instructor in preventive medicine at the University of Minnesota, where he was also associated with health service, has gone to Red Wing to become associated in a clinic with Drs. R. H. Hedin and E. Jueres.

* * *

Dr. W. C. Alvarez of Rochester delivered the annual Clarence M. Jackson lecture, sponsored by Phi Beta Pi medical fraternity, on the University of Minnesota campus, April 26. His topic was "Functional Gastrointestinal Disturbances."

* * *

Dr. M. B. Visscher, chairman of the University of Minnesota department of physiology, will address the Northwestern Hospital staff meeting in Minneapolis, May 13, on "Physiological Aspects of the Problem of Shock."

* * *

Professor Thomas Addis of Stanford University Medical School will lecture on "The Treatment of Glomerular Nephritis," Monday, May 13, at 4:30 p. m. in the Medical Sciences Amphitheater at the University of Minnesota.

* * *

The National Tuberculosis Association has approved a grant of \$500 to the University of Minnesota for a study under the direction of Dr. Arthur T. Henrici of the Department of Bacteriology for an investigation of the acidfast actinomycetes in relation to tuberculosis.

* * *

Seven Rochester men addressed the recent meeting of the American College of Physicians in Cleveland, Ohio. They were Drs. A. W. Adson, E. V. Allen, A. R. Barnes, P. W. Brown, G. C. Morlock, G. B. Eusterman and L. E. Prickman.

* * *

Dr. A. W. Adson of Rochester addressed the Phi Rho Sigma medical fraternity's alumni banquet at the Minnesota Club in Saint Paul, April 20. The dinner commemorated the fortieth year of Theta Tau chapter, University of Minnesota.

* * *

Dr. Rene J. Dubois of the Rockefeller Institute for Medical Research has been given the John Phillips Memorial Award by the American College of Physicians. Dr. Dubois' work dealt with the effect of agents extracted from soil microorganisms upon experimental bacterial infections. The John Phillips Memorial Award is in memory of Dr. John Phillips who died in rescue work at the Cleveland Clinic disaster.

OF GENERAL INTEREST

New at the University Health Service this year is Dr. John J. Boehrer, who received his M.D. from Johns Hopkins University in 1936 and was associated with Dr. F. H. K. Schaaf of Minneapolis prior to joining the Health Service staff.

* * *

Dr. R. Schwyzer, former Blackduck physician, is now located in Bulack, Switzerland. He is surgeon in a hospital there. The doctor has a son who is now taking military training, as is required of all young men in that country.

* * *

Dr. Bernard A. Watson, physician in the Health Service and assistant professor of preventive medicine at the University of Minnesota Medical School, resigned May 1 to go to Battle Creek, Michigan, to be associated with the Battle Creek Sanatorium as head of the division of metabolism and endocrinology.

* * *

A series of five lectures, arranged by the University of Minnesota department of physiology, were presented in April by Professor Herbert M. Freundlich, university professor of chemistry. The lectures were concerned with phases of colloid chemistry of importance to biology and medicine.

* * *

A George Chase Christian Scholarship has been awarded for 1940-41 to Dr. John E. Skoglund, clinical instructor in the division of nervous and mental diseases at the University of Minnesota Medical School, for study in clinical neurology at the Harvard University Medical School.

* * *

Dr. Albert V. Stoesser, associate professor in the pediatrics department at the University of Minnesota, and Miss Marie Druckrey of Green Bay, Wis., were married April 27 in Shawano, Wis. After a wedding trip to Virginia and North Carolina, Dr. and Mrs. Stoesser will make their home in Minneapolis.

* * *

Five members of the University of Minnesota Medical School staff will go to Bozeman, Montana, to address the Montana State Medical Association, June 19 and 20. They are Drs. Cecil J. Watson, Ernest M. Hammes, N. Logan Leven, Walter A. Fansler and William A. O'Brien.

* * *

The board of directors of the American Society for the Control of Cancer includes two Minnesota men: Dr. William A. O'Brien of the University of Minnesota Hospitals, and Dr. H. E. Robertson of the Mayo Clinic, Rochester. Dr. O'Brien's term continues until 1941 and Dr. Robertson's until 1942.

* * *

The Franklyn R. Wright lectureship in urology will be given by Dr. Reed Nesbit of Ann Arbor, Tuesday, May 7, at 8:15 p. m. in the Medical Sciences Amphitheater at the University of Minnesota. His topic will be "Hypertension in Unilateral Renal Disease." The lecture is under the auspices of the Twin City Urological Society.

Dr. K. G. Wakim of the Mayo Foundation has been appointed acting professor of physiology at the Iowa State University, College of Medicine, for a six-months' period, January 1 to July 1, 1940. Dr. Wakim assumed the teaching duties of Dr. Harry M. Hines, who is doing special work at Cornell University.

* * *

Mayo Foundation Demonstration Day was observed at the Mayo Foundation House in Rochester, April 19, when apparatus, technics and various exhibits from all departments of the Mayo Foundation and the Mayo Clinic were displayed. Dr. E. J. Baldes was chairman of the committee arranging the evening program.

* * *

The Board of Directors of the John and Mary R. Markle Foundation has awarded Dr. Cecil J. Watson, Associate Professor and Director of the Division of Internal Medicine, University of Minnesota Medical School, a grant-in-aid of \$3,600, in support of Dr. Watson's studies of the significance of the excretion of various porphyrins.

* * *

Dr. J. de J. Pemberton of Rochester was elected president-elect of the American Association for the Study of Goiter at its annual meeting in Rochester, April 15-17. He will take office at next year's convention, which is tentatively scheduled to be held in Boston. Approximately 150 goiter specialists from the United States and Canada attended the sessions.

* * *

When the Minnesota Academy of Science held its eighth annual meeting on the University of Minnesota campus April 19-20, members heard Dr. A. J. Carlson, head of the department of physiology at the University of Chicago, speak on "The Physiology of Aging."

The Minnesota Neurological Society will meet May 11 in Rochester.

* * *

If you know of patients who have suffered injurious effects from the use of proprietary remedies containing desiccated thyroid, recommended or sold for obesity, or injurious results from indiscriminate use, of two grains or less of desiccated thyroid per day, please report such cases to the office of MINNESOTA MEDICINE, 2642 University Avenue, Saint Paul, Minnesota.

* * *

Dr. Henry E. Michelson of Minneapolis was among the speakers at the New Orleans Medical conference early in April, at which Dr. Rudolph Matas of Tulane University School of Medicine was honored for his fifty years of service in medicine. Approximately 1,200 physicians and surgeons from the South attended the three-day conference. Dr. Michelson gave the lectures in dermatology.

* * *

Representing the University of Minnesota at the decennial meeting of the Convention for the Revision of the Pharmacopoeia of the United States of America, May 14, in Washington, D. C., will be Dr. Raymond N. Bieter, associate professor of pharmacology, who

MINNESOTA MEDICINE

OF GENERAL INTEREST

will represent the School of Pharmacy; Dr. A. D. Hirschfelder, Dr. Harold Wright, and Raymond Amberg, superintendent of the University Hospital, who will represent the Medical School.

* * *

New laboratories of physiological hygiene have been opened at the University of Minnesota under the direction of Dr. Ancel Keys, the opening being marked by an "open house," March 28 and 29. The laboratories are complete with x-ray and fluoroscope for doing roentgen kymographs in connection with the heart. A motor-driven treadmill has been installed to serve as a measure for determining the amount of work done by athletes.

* * *

Expected to return about the first of June from Peiping, China, are Dr. Irvine McQuarrie, University of Minnesota professor of pediatrics, and Dr. Frank E. Burch of Saint Paul. Both have been visiting professors for the past six months at the Peiping Union Medical College, which is under the auspices of the Rockefeller Foundation.

Dr. McQuarrie will be back at the university for the first session of summer school.

* * *

Dr. C. M. Tangen of Canby has sold his practice to Dr. J. H. Raymond of Triumph, who will take possession July 1. Dr. Tangen, who started his practice in Canby in 1925, shortly after his graduation from the Medical School of the University of Minnesota, is leaving to accept a teaching fellowship at the University. He will spend three years in study to become an eye, ear, nose and throat specialist. After his work at the University he plans to take an additional year of training in New York.

* * *

Dr. B. R. Kirklin of Rochester addressed several scientific meetings while visiting in the South. On April 16, he addressed members of the Shelby County Medical society in Memphis, and the following day he addressed the meeting of the Northeast Mississippi Thirteen Counties Medical society in Tupelo, Miss. The following week he spoke at a meeting of the Louisiana State Medical Society in New Orleans, and on April 28, he addressed the Florida Radiological Society and the Florida Medical Association in Tampa, Fla.

* * *

More than \$20,000 has been subscribed to date to the Minnesota Medical Foundation, it was reported at the April meeting of the board of trustees.

According to Dr. Robert L. Wilder, secretary, membership as of April 10 included three patrons, eighty life memberships, fifty-six annual memberships, and 105 student memberships.

* * *

Dr. Erling S. Platou, president of the Foundation which was organized a few months ago, has announced plans for a more intensive program to increase the membership among alumni and friends of the University of Minnesota Medical School.

Recently transferred to the Minnesota Medical

May, 1940

Foundation treasury was a Medical School Endowment Fund of slightly less than \$1,000, raised through the efforts of the late Dr. Richard O. Beard for the support of medical research. Transfer of the fund was voted by the Board of Regents at the recommendation of Dr. Harold S. Diehl, Dean of Medical Sciences.

* * *

The fiftieth anniversary of Dr. C. O. Wright's entrance into the practice of medicine was observed Monday, April 1, 1940, by the Luverne Rotary club, of which the doctor is a member. Dr. Wright received his "license" to practice medicine on April 1, 1890, following his graduation from the medical school of the University of Minnesota, and immediately thereafter began practicing his profession in Montana, as a surgeon for the Northern Pacific railroad then engaged in building its line west from Missoula. Dr. Wright has practiced in Luverne for forty-one years.

A special program was prepared for the event, including a few appropriate songs and short talks by members of the club. The speakers paid tribute to the remarkably active and unselfish service rendered by Dr. Wright during his long residence in Luverne, both as a physician and a citizen who found his greatest happiness in rendering service to others and in aiding in the upbuilding of the community. The talks were naturally interspersed with the recalling of amusing incidents at the expense of the doctor, who has been a life-long devotee of hunting, fishing, golf and other sports.

* * *

Dr. Clarence P. Truog, who has been an instructor in radiology at the University Medical School, left April 1 to be associated with James M. Jackson Memorial Hospital in Miami, Fla.

* * *

Dr. Herman Jensen, formerly of Atwater and more recently in the University Medical School radiology department, has gone to Oakland, Calif., to be associated with Alameda County Hospital.

* * *

Dr. Mancel T. Mitchell, former medical fellow in obstetrics and gynecology at the University of Minnesota, is now practicing in Eau Claire, Wisconsin.

* * *

Dr. Robert Meyer, who was formerly professor and director of the pathological institute of the first women's clinic in Berlin before he fled Germany, is now an assistant professor of obstetrics and gynecology at the University of Minnesota, where he confines his activities to research in gynecological pathology.

* * *

Dr. Gerald T. Evans has been appointed associate professor of medicine in charge of laboratory service at the University of Minnesota Hospitals. He was formerly assistant professor of physiological chemistry at Yale University Medical College.

In Memoriam

Timothy J. Moynihan
1877-1940

Dr. Timothy J. Moynihan, for some thirty-three years a practicing physician in the Midway District of Saint Paul, died March 8, 1940, following a cerebral accident two days previous.

Born on a farm at River Falls, Wisconsin, May 19, 1877, he attended the local county school and later State Normal School at River Falls. He graduated from Hamline Medical College in 1906 and took his internship at Saint Joseph's Hospital in Saint Paul. In 1907, he became associated in practice with Doctors Cannon and Balcome in the Midway district of Saint Paul and later opened an office at Raymond and University Avenues.

Dr. Moynihan was on the staff of the Midway Hospital, Saint Paul, and Saint Mary's Hospital, Minneapolis. He was also a member of the Catholic Order of Foresters, The Modern Woodmen of America and the Phi Rho Sigma medical fraternity.

Dr. Moynihan was married in 1912 to Gladys Westphal, who, with a daughter Phyllis, survives him. He was preceded in death by a brother Jeremiah in 1898, and a sister Hannah Moynihan Robinson in 1931. Also surviving him are three sisters, Mrs. Carl Yocum and Mrs. Ellen Dean of Saint Paul and Mrs. John Clifford of River Falls. Two brothers, Humphrey Moynihan of Saint Paul and Dr. A. F. Moynihan of Sauk Center.

Dr. Moynihan was not ostentatious but was a true general practitioner and loved his life work. As godfather to the youth and advisor to adults he leaves a place in the hearts of his patients and friends which can never be filled.

Dr. Moynihan was a member of the Ramsey County Medical Society, the Minnesota State and American Medical Associations.

Lida Osborn
1875-1940

Dr. Lida Osborn, for nearly forty years a practitioner of medicine at Mankato, died at her home March 11, 1940, following an illness of several months.

Dr. Osborn was born in Mankato and graduated from high school there in 1894. She taught for one year at the East Mankato school and another year at the Union school, both in Mankato. She received her medical degree from the University of Minnesota in 1900 and returned to Mankato where she had since practiced. Postgraduate courses were taken later at the Children's Lying-In Hospital in Chicago after which she specialized in women's and children's diseases.

Dr. Osborn was one of the group of physicians who organized the first clinic in Mankato, but at the time of her death she was practicing alone. She was a member of the staffs of Immanuel and Saint Joseph's

Hospitals and at different times was chairman and secretary of the Immanuel medical staff. She was a member of the Blue Earth County Medical Society, the Minnesota State and American Medical Associations.

Dr. Osborn was active in the First Presbyterian Church of Mankato and at one time was superintendent of the Sunday school. She was also a member of the Mankato chapter of the National Federation of Business and Professional Women.

Dr. Osborn is survived by a sister, Eleanor, of Niswawa and a brother, Louis M. Osborn, an attorney at Virginia.

Henry Wireman Cook
1877-1940

Dr. Henry Wireman Cook, vice president and medical director of the Northwestern National Life Insurance Company of Minneapolis, died suddenly of a heart attack, April 25, 1940.

Dr. Cook was born in Baltimore, November 8, 1877. He received his A.B. degree at Johns Hopkins University in 1898 and his M.D. there in 1902. He was medical referee in New York for the Mutual Life Insurance Company of New York from 1903 to 1905.

Dr. Cook became medical director of the Northwestern National Life Insurance Company in Minneapolis in January, 1906, a position he continued to hold until his death. He was credited with being one of the first to appreciate the value of blood-pressure reading in life insurance examinations. From 1922 to 1927 and again in 1936 he was chairman of the disability committee of the American Life convention and in 1923 served as chairman of the medical section of that organization. He served last year as president of the Association of Life Insurance Medical Directors and officially represented that organization at the meeting of the International Life Insurance Medical Congress in Paris last May.

During the World War Dr. Cook obtained leave of absence from the Northwestern Life Insurance Company to serve with the American Red Cross in Washington.

Dr. Cook was a member of Nu Sigma Nu medical fraternity. He was a member of the Minnesota Academy of Medicine and of the Hennepin County Medical Society, the Minnesota State and the American Medical Associations. He was the author of numerous papers on medical and underwriting subjects and recently collaborated with his son, Henry W. Cook, Jr., in writing a book on medical impairments and other factors concerned in life insurance risks.

Dr. Cook is survived by his wife, Ellen Davenport Cook; two sons, Henry W. Cook, Jr., of Minneapolis and Charles D. Cook, student at Princeton University; two daughters, Virginia F. Cook and Mrs. H. Brewster Atwater of Wayzata; and four grandchildren.

Dr. Cook recently returned from a vacation in the South and his seeming good health only contributed to the shock his untimely death gave his many friends. A golf and bridge enthusiast, his sociability endeared him to a wide circle of friends. He exemplified a fine type of American gentleman.

REPORTS and ANNOUNCEMENTS

MEDICAL BROADCAST FOR MAY

The Minnesota State Medical Association Morning Health Service

The Minnesota State Medical Association broadcasts weekly at 11:00 o'clock every Saturday morning over Station WCCO, Minneapolis (810 kilocycles or 370.2 meters) and Station WLB, University of Minnesota (760 kilocycles or 395 meters).

Speaker: William A. O'Brien, M.D., Associate Professor of Pathology and Preventive Medicine, Medical School, University of Minnesota. The program for the month will be as follows:

- May 4—Functional Disorders of Feet
- May 11—Common Diseases of Feet
- May 18—Care of Feet
- May 25—Diseases of Teeth

AMERICAN ASSOCIATION OF INDUSTRIAL PHYSICIANS AND SURGEONS

The twenty-fifth annual meeting of the American Association of Industrial Physicians and Surgeons, together with the first annual meeting of the American Industrial Hygiene Association, will be held at Hotel Pennsylvania, New York City, June 4, 5, 6, and 7, 1940.

This will be a four-day convention intensively devoted to the problems of industrial health in all of their various medical, technical, and hygienic phases, with particular stress on prevention and control of occupational hazards. Important programs have been prepared, and technical and scientific exhibits will be a feature of the convention. The dinner on Thursday evening, June 6, will be the occasion of the presentation of the Wm. S. Knudsen award for the year of 1939-40.

The medical profession is not only invited, but urged to attend these gatherings as they will be of unusual interest and value to all practitioners interested in industrial injuries and illnesses.

MINNESOTA ACADEMY OF OPHTHALMOLOGY

Dr. Erling W. Hansen of Minneapolis was elected president of the Minnesota Academy of Ophthalmology at a meeting in Minneapolis, April 12.

Other officers named are: Dr. William Kennedy of Saint Paul, first vice president; Dr. Theodore R. Fritsche of New Ulm, second vice president; Dr. George McGeary of Minneapolis secretary-treasurer; Dr. Henry Wagener of Rochester, chairman of the council; Dr. R. O. Leavenworth of Saint Paul and Dr. Kenneth A. Phelps of Minneapolis, members of the council.

The Academy will conduct a meeting in Rochester, May 10.

MAY, 1940

MINNESOTA SOCIETY FOR THE PREVENTION OF BLINDNESS AND CONSERVATION OF VISION

A concerted drive to eradicate preventable blindness is the aim of the recently organized Minnesota Society for the Prevention of Blindness and Conservation of Vision.

Incorporated under state charter "not for profit," the society, which has the endorsement of the Minnesota Academy of Ophthalmology, will serve as a fact-finding group and in an advisory capacity to already established organizations.

Officers are Mrs. Alfred F. Pillsbury, president; Dr. Egil Boeckmann, vice president; Louis W. Hill, Jr., treasurer; Dr. Frank E. Burch, secretary to the directors. Other directors of the society, which has offices at 503 Hamm Building, Saint Paul, are Mrs. Edwin White of Saint Paul; Rev. G. P. Sheridan of Rochester; Mrs. George W. Plant, Dr. Guy Stanton Ford, and Amos S. Deinard of Minneapolis; Edward Freeman of Virginia; J. C. Lysen of Faribault. Some forty men and women, who are outstanding in the state's medical, welfare and educational fields, are serving on its advisory committee.

Unendowed, the society is seeking small donations from Minnesota citizens for the support of its program, which is centered around the slogan, "Over one-half of all blindness is preventable." Donations may be mailed to the treasurer, Mr. Louis W. Hill, Jr., First National Bank Building, Saint Paul.

SAINT PAUL SURGICAL SOCIETY

Some 150 members and guests of the Saint Paul Surgical Society held an annual banquet, Thursday, April 11, at the Minnesota Club, Saint Paul.

The guest speaker of the occasion was Dr. R. W. McNealy, Associate Professor of Surgery, Northwestern Medical School, Chief Surgeon of the Wesley Memorial Hospital and Chief of Staff of the Cook County Hospital, Chicago. The subject of his address was "Perforation in Peptic Ulcer: a Critical Review in 700 Cases."

Representatives of the Duluth and Minneapolis Surgical Societies were guests. Dr. V. N. Peterson, president of the Saint Paul Surgical Society, presided. Dr. Logan Levin is secretary.

UNIVERSITY HOSPITAL EXECUTIVES MEET

Meeting on the University of Minnesota campus, April 12 and 13, members of the University Hospital Executives Council reelected its officers: President, Dr. Harley Haynes, director of University hospitals at the University of Michigan; secretary-treasurer, George Bugbee of Cleveland.

Twenty-six administrative officers from hospitals at

REPORTS AND ANNOUNCEMENTS

eight universities attended the two-day session. Represented were the Universities of Indiana, Minnesota, Rochester, Cleveland, Wisconsin, Chicago, Iowa and Michigan.

The program for training of residents and internes was discussed by Dr. Robin Buerki of Chicago, director of study on the American Hospital Association commission for graduate medical education. Other topics discussed during the meeting included student nurses in hospitals, personnel, and maintenance.

WASHINGTON COUNTY

At the regular monthly meeting of the Washington County Medical Society held at the Stillwater Club rooms, April 9, 1940, a number of announcements were made, and also reports from several committee chairmen. The proposed milk ordinance was brought before the meeting, discussed at length, and the Society recommended its adoption. Dr. F. M. McCarten, who was appointed to take the course presented at the University of Minnesota on the Care of the Premature and Newborn as a member from Washington County, gave a full and very good account, both at the medical staff meeting of the Lakeview Memorial Hospital on April 5 and before the regular meeting of the Washington County Medical Society on April 9.

The Society decided to show its appreciation to the physicians who had generously given of their time and knowledge by lecturing to the members during the past year, in the form of a stag dinner at the Stillwater Club on May 14. Those "golflily" inclined are invited to come to the Stillwater Golf Club at 2 o'clock in the afternoon where they will be welcomed by the following committee: Robert M. Burns, Carl L. Larsen, Frank J. Savage, Wilhelm von der Weyer and E. M. Jones, all of Saint Paul, and Royal C. Gray of Minneapolis.

WINONA AND WABASHA COUNTIES

The ninth annual joint meeting of the Winona and Wabasha County Medical Societies, and the fifteenth annual dinner tendered by the Buena Vista Sanatorium Commission to the physicians of the counties served, was held at the Sanatorium at Wabasha Monday evening, April 8. There were thirty-three in attendance, including physicians and members of the commission.

Dr. E. W. Ellis of Elgin, president of the Wabasha County Society, officiated as toastmaster.

Following the dinner, a program was presented, arranged by Dr. R. R. Hendrickson, superintendent and medical director of the sanatorium. Dr. B. S. Adams of Hibbing, president of the State Medical Association, gave an address on "Socialized Medicine," particularly in its application to plans for sickness and disability insurance.

Dr. Adams, not long ago, visited medical centers in

several European countries, where state controlled medical practice prevails, and he contrasted medical service there with that in the United States. He stated that medical and surgical equipment, hospital service, and conditions under which doctors work there were very poor as compared with the United States, and naturally, results of treatment were not nearly so good.

R. R. Rosell, executive secretary of the State Medical Association, described the plans and policies in the state regarding sickness insurance and medical relief work.

Dr. Hendrickson presented an able paper on "The Diagnosis of Tuberculosis."

After a vote of thanks to the sanatorium management, the meeting adjourned.

POSTGRADUATE COURSE IN OBSTETRICS

The Department of Obstetrics and Gynecology of the University of Chicago and the Chicago Lying-in Hospital are offering postgraduate courses of five to six weeks in obstetrics for practitioners during the next several months. The didactic part of the courses will be given for the most part by Dr. M. W. Boynton and Dr. J. H. Morton.

The first three periods will be: April 29 to June 8; June 17 to July 20; July 22 to August 24. The enrollment is small and the fee only \$15.00. Those interested may address inquiries as follows: Postgraduate Course, Department of Obstetrics and Gynecology, 5848 Drexel Avenue, Chicago, Illinois.

NORTHERN MINNESOTA MEDICAL ASSOCIATION

The Northern Minnesota Medical Association meets in Duluth on July 19 and 20, 1940.

Dr. O. W. Parker of Ely is president of the Society, and Dr. Clarence Jacobson of Chisholm, the Secretary.

The Program Committee consists of Drs. F. J. Hirschboeck and S. H. Boyer, Jr., of Duluth, R. N. Jones of St. Cloud, and O. O. Larson of Detroit Lakes, Minnesota.

STATE MEDICAL GOLF TOURNAMENT

The golf tournament held at Rochester, April 21, in connection with the State Medical Association meeting was won by Dr. C. Hunter Shelden with a low gross of 78; second low gross was obtained by Dr. J. W. Kernohan with a score of 81.

Numerous other prizes for least number of putts, lowest scores on the par 3 holes, the most 3's, 4's, 5's and 6's, et cetera, were given. The course was in excellent condition and although the day was rather cold and windy, the play was enjoyed by some thirty-five entrants. There were sixteen prizes donated by the commercial exhibitors.

PROCEEDINGS of the MINNESOTA ACADEMY OF MEDICINE

Meeting of March 13, 1940

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Town & Country Club on Wednesday evening, March 13, 1940. Dinner was served at 7 o'clock and the meeting was called to order at 8:10 by the president, Dr. James Johnson.

There were thirty-one members and one guest present. Dr. Edward B. Churchill, of Boston, was a guest at this meeting.

The following men were elected as candidates on the University Membership list, Drs. Nordland and Cole acting as tellers: Dr. Harold S. Diehl, and Dr. M. B. Visscher.

The secretary read some proposed changes in the Constitution regarding the method of procedure in the election of new members. These will be published on the monthly program and voted on at a subsequent meeting.

The scientific program consisted of the following case reports:

BENIGN ADENOMA OF THE BRONCHUS

KENNETH PHELPS, M.D.

Minneapolis

Adenoma is the most frequent benign tumor occurring in the bronchial tree. This type of growth can now be recognized pathologically and is being more frequently diagnosed clinically. It is of importance because a cure is often possible.

Pathologically, these tumors are said, by some, to represent a congenital anomaly as the tumor has a marked resemblance to fetal lung. Others say they originate from the bronchial mucous glands. Some state the smaller bronchi have no such glands and therefore adenomas are found only in the larger bronchi.

Some compare them to the carcinoid tumors of the intestinal tract or to the mixed tumors of the parotid and do not classify adenoma as exclusively a benign tumor. Earlier pathologists were apt to diagnose this tumor adeno-carcinoma.

Microscopically, the epithelial covering is seen to rest on an intact basement membrane under which is a very vascular layer of loose connective tissue. This vascular layer is so characteristic that some call this tumor "vascular adenoma." The tumor consists of regular, cuboidal and cylindrical cells, arranged in solid columns or acini. They are uniform in structure and staining characteristics, contain round or oval nuclei and lack mitotic figures. Rarely does the tumor extend into the wall of the bronchus, but when this occurs complete eradication is considerably more difficult.

The lung parenchyma is never invaded and metastases do not occur.

Adenoma of the bronchus occurs more frequently (60 per cent) in women, between the ages of twenty

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and forty. It grows slowly and the only symptom may be hemoptysis. In some women this occurs more frequently during the menstrual period. The characteristics of the hemoptysis are that its onset is sudden, without permonitory signs and it may cease as abruptly with no further streaking of the sputum.

A history of preceding attacks of pneumonia is common. Possibly, we may assume that the tumor caused obstructive atelectasis with pneumonitis resulting. The tumor, being so vascular, can change in size rapidly and succeeding attacks of atelectasis may follow.

Wheezing is frequently noted by the patient and has led to the diagnosis of asthma. Dyspnea may occur when the patient changes his position. If the tumor is on a long pedicle it may shift its position and cause obstruction to a portion of the lung. This shifting may produce a wheeze in certain positions and not in others. Cough is quite constant.

Physical signs and x-ray findings may not be diagnostic, if the tumor has not reached a size which will obstruct the bronchus. However, the typical hemoptysis together with the other signs discussed above, should make one consider a diagnostic bronchoscopy. When the diagnosis can be established before the development of severe lung damage, due to chronic bronchial obstruction, a much better result can be obtained.

If the condition is unrecognized and untreated, obstruction of a bronchus will eventually occur. This means atelectasis, recurring pneumonitis, bronchiectasis, abscess or at times pyothorax. Bronchial obstruction is a definite indication for bronchoscopy, for both diagnosis and treatment.

Treatment consists of removing the tumor. If possible, this should be done through the bronchoscope. Punch forceps may produce considerable bleeding though electrocoagulation will help control this. A preliminary pneumothorax has been advised by some as a method of preventing blood from reaching the alveoli and causing aspiration pneumonia. Too vigorous cauterization may cause scar formation with stenosis of the bronchus resulting.

Radium applied locally or deep x-ray therapy have been used.

Surgical extirpation may be necessary particularly when the tumor has been long unrecognized and advanced pulmonary suppuration has resulted.

Case Report

Mr. R. B. H., aged twenty-seven, a conductor on the Northern Pacific Railroad, was referred to me by Dr. A. W. Ide, November 29, 1939.

The family history is negative.

The past history reveals that he has had two attacks of pneumonia, one in 1931 and the other in 1932. He coughed a little blood at this time. Following this, numerous telangiectatic areas appeared on his face and lips.

In April, 1934, he had a sudden attack of hemoptysis which cleared up rapidly. He was observed in the

Northern Pacific hospital and tuberculosis ruled out. The hemoptysis was considered to be from a bronchial varix—similar to those present in his mouth, cheeks, and lips.

In 1935, he coughed up a half glass of blood in three days, without fever or weight loss.

In May, 1939, a similar attack occurred, but the cough was worse and persisted. He raised yellow material until November, 1939, when he coughed up blood from four to five days—as much as a third of a tumbler full at a time. He now noticed a wheeze and a flapping noise when he coughed, which he localized on the right side. He was sent to the Northern Pacific Hospital in Saint Paul, for a bronchoscopic examination.

The chest radiograph gave negative findings.

The chest physical examination was negative except for the wheeze. His blood was normal. Blood pressure and urine were also negative.

Bronchoscopic examination: Blood was seen coming through the glottis and in the trachea. A tumor was seen in the right main bronchus. It bled very freely following the taking of a specimen for biopsy.

A diagnosis of benign adenoma was made by Dr. E. T. Bell.

On December 15, 1939, the tumor was completely removed by punch forceps and the base cauterized with 25 per cent silver nitrate.

The tumor was attached just to the right of the carina and was lying in the right main bronchus. It was about one and one-half centimeters in diameter.

Dr. Beach of Tacoma has written that he has seen the patient recently and he has had no recurrence of the hemoptysis and feels perfectly well.

Pathologists are not all agreed that this tumor is always benign.

A history of the recurring characteristic hemoptysis, wheeze, cough, together with the physical signs, x-ray findings, and bronchoscopic appearance should make an early diagnosis possible.

Bronchoscopic removal has resulted in many cures.

Discussion

DR. EDWARD D. CHURCHILL, Boston (by invitation): It is very kind of you to call on me and I wish I had more to add to this beautiful presentation by Dr. Phelps concerning this peculiar tumor. I can't add anything about its true nature and the pathologists and microscopists I work with are unable to solve the problem. They are puzzled concerning the histogenesis.

I suggested the idea of fetal lung rest to the pathologists but they do not agree with it. At the moment, Dr. Mallory thinks the tumor is more like the carcinoid that occurs in the intestine than any other neoplasm he knows about, yet he cannot demonstrate silver staining elements. Drs. Graham and Womak believe adenomas should be classified as so-called mixed tumors of the lung. Our pathologists do not agree with that. In San Francisco, Brumm and Goldman are drawing an analogy between this tumor and mixed tumors of the salivary glands.

I do not feel that these tumors are malignant in the sense that they are apt to metastasize or recur. They may show some cellular invasion of the surrounding lung, but we know that carcinoid tumors in the intestine may even show involvement of the adjacent lymph nodes and yet may exist for years without growth or spread.

The histories that Dr. Phelps gave are perfectly typical. It seems to me the importance of this tumor at the moment lies in putting it in a separate group from bronchogenic carcinoma. I don't care what it is called, so long as it is not confused with bronchogenic carcinoma.

To do so will cloud the results of surgery and radiation therapy in carcinoma and they are already clouded enough now. The first adenoma I ran across I took out and reported it in the literature as carcinoma and have been busy retracting it ever since. Chevalier Jackson reported permanent arrest of a carcinoma removed through the bronchoscope; but his son, Dr. C. L. Jackson, has reviewed the case and believes it was an adenoma.

We find if we take the microscopically proven cases of cancer and the microscopically proven cases of adenoma, the proportion is about one adenoma to ten bronchial cancers. Now, if the many cancers that are not proven microscopically are included, it is probable that one out of twenty bronchogenic neoplasms will be an adenoma. But if we take the *respectable* bronchogenic tumors including cancer of the lungs, the tumors we can and have done something about surgically, these tumors make up about 25 per cent of the group. If I want to say adenomas are cancer, I can change my statistics about 25 per cent toward the better side because these patients, barring operative accident, are going to get well.

The only solution is to establish, as was done in bone sarcoma, a central tumor registry. The Association of Thoracic Surgery is working on such a plan. Adenomas may present themselves in the most bizarre way. The most striking case we have seen was a patient admitted to the hospital in coma because of veronal poisoning. He had taken veronal for sciatic pain. There were cough and hemoptysis, and the obvious diagnosis was cancer of the lung with metastases to the spine. He was ultimately discharged after lobectomy for adenoma of the bronchus and extirpation of a ruptured intervertebral disc, and is back at work. Neither diagnosis would have been possible ten years ago.

DR. JOHN F. NOBLE, Saint Paul: Speaking from the standpoint of pathologists, rather early in the game we made mistakes in the diagnoses of carcinoma of the lung. These mistakes have been made on cases of adenoma of the bronchus similar to the one just presented by Dr. Phelps. I think now, however, we have come to be able to spot these tumors at autopsy and perhaps at biopsy. I think the case just presented by Dr. Phelps is undoubtedly one of adenoma of the bronchus. The problem of diagnosis of carcinoma of the lung by biopsy is an extremely difficult one. So far, we have been fortunate in our experience in dealing with small biopsies of the bronchus and no serious errors have been made. Because of the extremely small size of the tissue submitted for examination, it is possible to have metaplasia of such a degree that a mistaken diagnosis of malignancy might be made.

We had at the Ancker Hospital a girl in her early twenties on whom I made a diagnosis of carcinoma of the lung. At that time she was extremely ill with pulmonary sepsis but following the biopsy her pulmonary infection improved and she was able to return to work. She was not seen again for eighteen months when she was examined by another physician. She was a picture of health, and the x-ray films of the chest showed a marked clearing of the atelectasis. The patient was presented at another hospital staff meeting, and I was fearful that a serious error had been made. After the patient was sent from the room, however, the physician admitted that the patient had again lost ten to fifteen pounds from her top weight, and that she was showing x-ray evidence of recurring atelectasis. The last of that story is not told, but I feel certain that the patient has a carcinoma of the lung.

Sooner or later, however, errors of diagnosis on biopsies of the bronchus are bound to be made because of the character of the material submitted for examination. I think that an accurate diagnosis of the tumors of the bronchus by biopsy depends upon an extremely close relationship between the surgeon, the bronchoscopist, and the pathologist.

Dr. E. M. Hammes, Saint Paul, gave the following case report and presented the patient.

THE SCALENUS SYNDROME: BRACHIAL PLEXUS NEURITIS

E. M. HAMMES, M.D.

Saint Paul

A unilateral brachial plexus syndrome of non-traumatic origin always presents an interesting diagnostic problem. Enlarged cervical ribs, metastatic involvement of the cervical vertebrae, hypertrophic arthritis of the spine, cervical hypertrophic pachymeningitis due to syphilis, syringomyelia, cord tumor, are among the possible etiologic factors. The typical syndrome of an elongated cervical rib is frequently encountered. It usually begins in middle adult life, with a heavy dragging sensation in the shoulder, pain over the deltoid extending down the arm, with weakness of the musculature, some atrophy of the intrinsic hand muscles with sensory disturbances, especially in relation to the ulnar nerve, with a slow progressive course until the extremity becomes practically useless. Associated with this may be other trophic changes, vasomotor disturbances, and a difference in the blood pressure of the two sides. Roentgenologic studies reveal an elongated cervical rib as the causative factor. Occasionally, this symptom group is encountered in patients in whom x-ray studies do not reveal a cervical rib. Naffziger and Grant, in the journal, *Surgery, Gynecology and Obstetrics*, December, 1938, report eighteen such cases and suggest the term "Scalenus Syndrome." In the literature to that date, fifty-one similar cases have been reported. The authors believe that, "the etiology consists largely in anatomical and developmental factors that result in an abnormal position of the shoulder girdle in relation to the thoracic cage. Embryologically, a postfixed brachial plexus is more readily subjected to tension and angulation in its course over the first rib and behind the anterior scalenus muscle. Injury, excessive occupational strain, or poor musculature, may cause the shoulder to droop and precipitate the signs and symptoms."

Myotomy of the scalenus muscle frequently produces excellent results, even in long-standing cases.

Case Report

This patient presented four outstanding symptoms:

1. Slow progressive weakness of the left arm with atrophy of some of the intrinsic hand muscles.
2. Pain and tenderness in the left supraclavicular space extending down the arm and hand.
3. Sensation in the left side of the neck as if "cords were tight and short."
4. At times, the left arm feels full and swollen, especially when she is lying down. This sensation disappears when the arm is elevated and a feeling develops as if blood were rushing into the arm.

The patient is a female, aged forty-two, who was referred to us by Dr. F. V. Langenderfer on February 19, 1940.

Her family and personal history were negative except that her right hand is deformed due to a burn at the age of eighteen months. Because of this, she per-

forms most of her heavy work with the left hand, such as husking corn, carrying heavy milk cans, and other farm work.

Her present complaint began in 1931, nine years ago. At that time she noticed numbness, pain, paresthesia, and weakness of the left thumb. This continued for three months, then disappeared completely for six months. The condition recurred and also involved the palmar surface of the second and third fingers. The pain gradually extended up the extensor surface of the entire arm to the tip of the shoulder, and the entire arm tired easily. This continued for four years. She then developed a sensation as if the cords in the left side of the neck were too short and tight. The muscles around the left thumb began to waste and the weakness in the arm became more pronounced. These symptoms continued off and on until October, 1939, when they became more pronounced. She now is unable to pick up objects with her left hand, to button her clothes, or do any heavy work. The pain is more pronounced. The arm feels big and swollen, especially after she goes to bed and is quiet. When she moves it about or elevates it, she has a sensation as if blood were rushing into it.

The physical examination was negative except for a deformed right hand.

The neurologic examination is negative except for her left arm. Pupils, fundi, eye movements, and other cranial nerves are normal. The right upper extremity is normal throughout. The left upper extremity possessed normal muscle strength in the left upper arm with apparent weakness because she said it pained in the elbow when she held the arm against resistance. Movements at the wrist were good. The biceps, triceps, and periost reflexes are normal. She had atrophy of the thenar, adductor pollicis, and slight atrophy of the interossei muscles in the left hand. The grip, with the dynamometer, in the left hand was 42. We were unable to test the right hand because of the deformity. Sensation was normal over the entire left arm to the wrist. From the wrist down on the palmar surface of the hand, including the inner portion of the thumb, pain and tactile sense were impaired. On the dorsal surface of the hand sensation was normal except over the distal phalanges of the first three fingers where touch and pain sense were impaired. She had marked tenderness in the left supraclavicular region and over the entire left arm, but there was no definite nerve-trunk tenderness.

Her hemoglobin is 80 per cent; blood pressure, left arm 126/74, right arm 124/76; urine normal. The blood Wassermann reaction was negative.

The spinal fluid was clear and 6 c.c. were removed. The pressure was 180 mm. of water, which rose promptly to 350 with jugular compression, with prompt return to 180 when the pressure was released. It contained one cell, a trace of globulin, a negative Wassermann, a negative colloidal gold curve, 1111100000, and quantitative protein 30 mgms.

X-ray examination of the cervical spine and the left shoulder region was negative. There was no evidence of cervical rib or arthritis.

A diagnosis of scalenus syndrome was made and a myotomy of the scalenus muscle will be done next week.

* * *

Addenda: This patient was operated on by Dr. W. C. Carroll at St. Joseph's Hospital, on March 26, 1940. The left scalenus anticus muscle was markedly hypertrophied and tense, and was severed. Within forty-eight hours the patient stated that the pain in the shoulder and arm had definitely improved, and the fullness and congested feeling have subsided. She should make a complete recovery.

SARCOMA OF THE ULNA; LATE RESULTS

ARNOLD SCHWYZER, M.D.
Saint Paul

Dr. Schwyzer reported a case of swelling of the lower end of the right ulna which proved to be giant cell sarcoma. Resection of the ulna in June, 1916, and insertion of a piece of tibia. Late results reported. Movements free, arm strong, no complaint. Radiographs show good transformation of the transplant into tubular bone. Full report of the case will be given later.

CONGENITAL HEMOLYTIC ANEMIA WITH SPLENECTOMY

Case Report

MARTIN NORDLAND, M.D.
Minneapolis

Congenital hemolytic anemia is a chronic, hereditary disorder in which blood destruction over-balances blood formation, with resultant icterus, anemia and splenomegaly. It is generally agreed that heredity plays a great part in the etiology, most of the cases being inherited according to Mendelian law, and that the increased blood destruction is dependent upon increased fragility of the red blood cells. It has been observed, however, that in a number of mild cases the fragility test was normal.

The case report here submitted is that of a white, unmarried female, forty-four years of age, admitted to the hospital on September 12, 1939. Her presenting complaints were: (1) intermittent attacks of jaundice for the past twenty years; (2) intermittent spells of anemia for the same period; (3) severe upper right quadrant pain for ten days prior to admission to the hospital; (4) irregular spells of digestive distress associated with ingestion of fatty foods; and (5) recent complaints of frequency, nocturia, and some dysuria.

The patient had a thyroidectomy with uneventful recovery in 1937. The past history otherwise was negative except as stated above.

Physical examination of the patient revealed a fairly well-nourished, well-developed, white, but icteric appearing female of about the stated age, who was not in acute distress. Her sclerae were icteric and the pupils reacted to light and accommodation. The throat was clear but the mucosa was yellowish tinged. The lungs and heart were normal. The blood pressure was 128/68. Abdominal examination revealed no unusual tenderness, the liver was not palpated, but the spleen was felt four fingers (8 cm.) below the costal margin in the left mid-axillary line.

Blood examinations on admission showed a hemoglobin of 32 per cent, red blood cells 1,610,000, with a majority of spherical microcytes. There was a color index of 1.1 and a reticulocyte count of 4.5 per cent. Fragility was increased by 25 per cent.

Because of the history and the findings recorded above, a diagnosis of congenital hemolytic anemia with jaundice and an associated cholelithiasis was made.

However, the situation suddenly became serious and confusing. Two days after admission the patient's temperature jumped to 104° and for six days the temperature fluctuated rapidly between 99° and 105.6°. A catheterized specimen of urine was found to be loaded with pus cells. Albumen was present 2 plus. There were a few r.b.c., and a culture of this urine showed *B. coli*. The hemoglobin which was recorded 32 per cent on admission, September 12, 1939, had dropped to 26 per cent by September 16 (Fig. 1). On

cystoscopic examination, September 23, 1939 (11th day) the patient was found to have a marked cystitis with the kidneys apparently free from pus, but culture showed *B. alkaligenes*. From roentgenological ex-

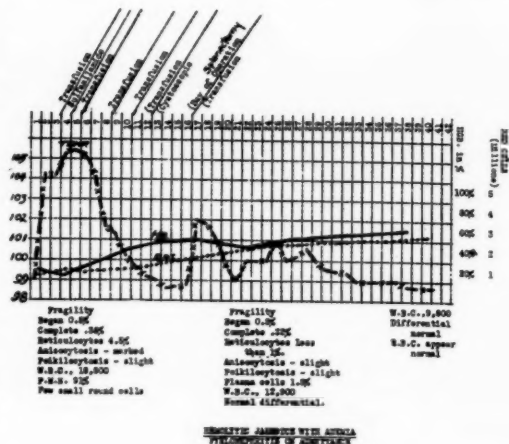


Fig. 1.

amination, following the retrograde pyelography, the following conclusions were drawn: enlargement of the right kidney with normal renal pelvis, marked enlargement of the liver and spleen with the enlarged spleen pushing the kidney down and medialward and thus distorting the pelvis. There were also multiple calcified gallstones (Fig. 2).

The patient was placed on a regime of multiple transfusions of citrated blood. In spite of the low hemoglobin (25 per cent) and the jaundice, the patient was given sulfanilamide by Dr. Ulrich. This therapy was followed by marked improvement and within four days the temperature had become normal, the pus had disappeared from the urine and the hemoglobin was elevated to 49 per cent.

By September 28, 1939 (16 days after admission) the patient was physically fit for splenectomy, which was then considered the treatment of choice. Five hundred c.c. of citrated blood was administered to the patient preceding the operation. Under gas and ether anesthesia, a splenectomy was performed. The spleen was found to be widely attached to the cardiac portion of the stomach, the splenic flexure of the colon and to the diaphragm. This caused considerable trouble in its removal. To assist in the displacement of the spleen, the table was sharply tilted so that the head was considerably higher than the feet. Fifteen minims of epinephrin was injected into the splenic artery immediately preceding the application of the ligature to this vessel. Application of the ligature to the splenic vein was delayed about 60 seconds to permit thorough emptying of the blood contained in the spleen into the general circulation. Four transfusions of 500 c.c. each of citrated blood were given on alternate days following the operation.

The spleen was 23 cm. in length and 16 cm. in diameter following excision (Fig. 3). Its shape was normal; weight was 1,450 grams. On cut surface it was chocolate-colored and firm without much free blood. The corpuscles were somewhat less numerous and less distinct than in the normal and on microscopic section there were marked numbers of erythrocytes throughout the spleen with a reduction in number of splenic corpuscles. On the 25th postoperative day the patient was discharged from the hospital.

Laboratory findings showed hemoglobin 65 per cent, r.b.c. 2,950,000 per cm., color index 1 plus, reticulocytes less than 1 per cent, and the fragility of the erythrocytes apparently unchanged.

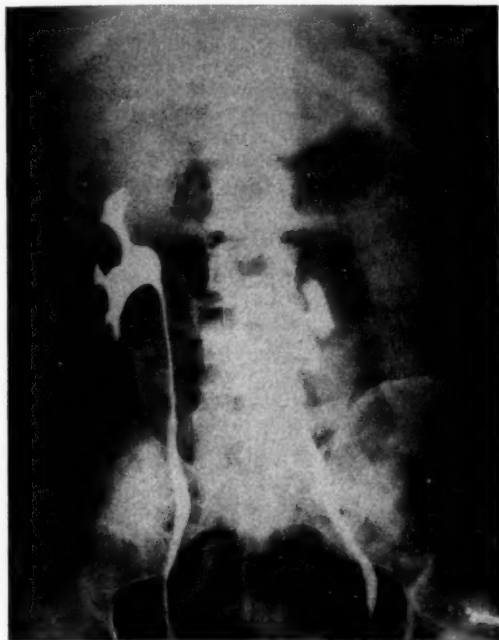


Fig. 2.

The correct diagnosis in almost all cases of congenital hemolytic jaundice should be made by the presence of icterus with splenomegaly, associated anemia, increase in the number of polychromatophilic red cells and reticulocytes, and increased fragility. Most mistakes are made in the mild cases. Splenectomy is quickly beneficial in the severe cases; relief of symptoms is usually permanent. The operative mortality is variable in different clinics but should not be high. There is a rapid postoperative return of the red count to normal because of the speedy regeneration of the red blood cells. Occasional cases may require cholecystectomy as well.

Discussion

DR. H. L. ULRICH, Minneapolis: There are several items which could be stressed in this case. It is not a glaring mistake to make a diagnosis of cholecystitis in the presence of hemolytic jaundice. Sixty per cent of the cases present this complication. A bedside diagnosis could be made on this patient with the physical findings and history. The urgent thing, she was so very ill. Urinary antiseptics had been given. A transfusion had not made any difference. In fact, these cases do not take transfusions very well. Having seen a report of a case of neutropenia with sepsis which responded to sulfanilamide, we thought we would use it for her bladder infection. Her hemoglobin was at its lowest and the temperature was at the highest. Giving sulfanilamide to a patient with a hemoglobin of 28 per

cent is a rather drastic procedure. Then there was her jaundice. The liver was under pressure trying to excrete the enormous amount of bilirubin being delivered to it. Liver insufficiency is another contraindica-

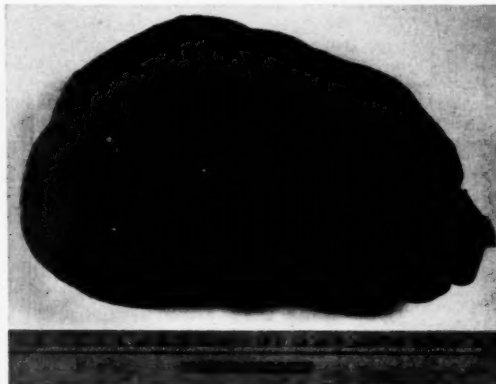


Fig. 3.

tion in the use of sulfanilamide. We were traveling on thin ice. But the response was most favorable. Her urine cleared up. Her temperature came down and her hemoglobin and reds began to rise.

We did not see the spleen contract at the time of the operation when adrenalin was injected into the splenic artery. It may have been that we did not wait long enough or it may have been due to the extensive adhesions of the splenic capsule. No blood examination was made before or just after the adrenalin injection. The cholelithiasis and cholecystitis can be taken care of when this patient has rehabilitated her blood following the splenectomy.

MULTIPLE TUMORS OF THE TESTICLE

GILBERT THOMAS, M.D.
Minneapolis

Dr. Thomas gave a report on the above subject.

Discussion

DR. J. C. LITZENBERG, Minneapolis: I would like to ask Dr. Thomas one or two questions. In testicular tumors, have you any figures to show the percentage that gave the positive hormone test for chorion epithelioma?

DR. THOMAS: No, I haven't. I have a report now on my desk, by a urologist in New York. In this paper the doctor describes the chorion epithelioma but does not include a complete bibliography.

DR. LITZENBERG: Theoretically, one should not get a positive hormone test unless there is chorion epithelioma present. If the prolan test is positive, chorion epithelioma must be present.

DR. H. L. ULRICH, Minneapolis: Some years ago (it was when Dr. Berglund was with us) we had a patient—a young man—in the University Hospital, who had numerous cysts of the lung. There was a good deal of speculation regarding these growths. It was not until some one pulled down his bed clothing and examined his testicles that it was noticed he had a teratoma on one of them. This explained the origin of the cysts very conclusively.

The meeting adjourned.

A. G. SCHULZE, M.D., Secretary.

BOOK REVIEWS

Books listed here become the property of the Ramsey, Hennepin and St. Louis County Medical libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

COMPENDIUM OF REGIONAL DIAGNOSIS IN LESIONS OF THE BRAIN AND SPINAL CORD. 11th Edition. Robert Bing, Professor of Neurology, University of Basel, Switzerland. Translated and edited by Webb Haymaker, Assistant Clinical Professor of Neurology and Lecturer in Neuro-Anatomy, University of California. 292 pages. Illus. Price, \$5.00, cloth. St. Louis: C. V. Mosby Co., 1940.

CANCER IN CHILDHOOD and a Discussion of Certain Benign Tumors. Harold W. Dargeon, M.D., F.A.A.P. Attending Pediatrician, Memorial Hospital for Cancer and Allied Diseases, New York; Associate Pediatrician St. Luke's Hospital, New York; Associate Pediatrician New York Foundling Hospital; Instructor in Pediatrics, College of Physician & Surgeons, Columbia University. 114 pages. Illus. Price, \$3.00, cloth. St. Louis: C. V. Mosby Co., 1940.

INTRODUCTION TO MEDICINE. Don C. Sutton, M.S., M.D. Associate Professor of Medicine, Northwestern University School of Medicine; Attending Physician, Medical Division of Cook County Hospital; Chief of Cardiac Clinic, Cook County Hospital, Chicago; Attending Physician, Evanston Hospital. 642 pages. Illus. Price, \$3.25, cloth. St. Louis: C. V. Mosby Co., 1940.

CHEMOTHERAPY AND SERUM THERAPY OF PNEUMONIA. Frederick T. Lord, M.D., Clinical Professor of Medicine, Emeritus, Harvard Medical School; Member of Board of Consultation, Massachusetts General Hospital; Elliott S. Robinson, M.D., Ph.D., Director Division of Biologic Laboratories, Massachusetts Department of Public Health; Roderick Heffron, M.D., Medical Associate, the Commonwealth Fund; Formerly Field Director Pneumonia Study and Service, Massachusetts Department of Public Health. 174 pages. Illus. Price, \$1.00, cloth. New York: Commonwealth Fund, 1940.

LET'S TALK ABOUT YOUR BABY. H. Kent Tenney, Jr., M.D., F.A.A.P. Associate Professor of Pediatrics, University of Wisconsin Medical School, Associate Pediatrician to State of Wisconsin General Hospital. 115 pages. Illus. Price, \$1.00, cloth. Minneapolis: University of Minnesota Press, 1940.

SYNOPSIS OF OBSTETRICS. Jennings C. Litzberg, M.D., F.A.C.S. Professor Emeritus of Obstetrics and Gynecology, University of Minnesota Medical School, Minneapolis. 394 pages. Illus. Price, \$4.50, flexible binding. St. Louis: C. V. Mosby Co., 1940.

THE KOSHER CODE of the Orthodox Jew: Being a literal translation of that portion of the sixteenth century codification of the Babylonian Talmud which describes such deficiencies as render animals unfit for food (Hilkot, Terefoot, Sulhan Aruk); to which is appended a discussion of Talmudic anatomy in the light of the science of its day and of the present time. By S. I. Levin, Senior Rabbi of Minneapolis and Edward A. Boyden, Professor of Anatomy, University of Minnesota. Cloth. Price \$4.50. 243 pages. Illus. Minneapolis: The University of Minnesota Press, 1940.

The subtitle tells exactly what this book consists of in its scope and purposes. It is a work of great historical and scientific value; one which may be read with

interest and profit by all who seek to be better informed about the close intertwining of the development of religion and medicine. How Dr. Boyden came to become interested in this particular phase of the subject is told by him in the preface. It was when he was engaged in examining some ten thousand vertebrate livers in the abattoirs of Boston that he met "kosher cutters" from the local synagogues, who told him that such anomalies as he was seeking could be found described in the latest codification of the Babylonian Talmud, published in Venice in 1564. This greatly aroused his curiosity and he spared no effort to "follow through" and secure authentic information, all of which confirmed what he had been told and finally resulted in this masterly piece of collaboration with Rabbi Levin.

More than most languages, the Hebrew and the Arabic contain many words which have a double meaning and many somewhat similar words which have exactly opposite meanings. This reviewer knows of many instances, for example, in the Old Testament where failure on the part of the translators to appreciate this has caused many errors to creep in and change the whole meaning of the context. In the present instance the translators have exerted every effort to preserve the literal meaning of every word, often very difficult for the reasons given and for the further one that sometimes there is no adequate equivalent in English. The result is an excellent piece of work, for the completion of which we congratulate both of the scholarly translators and annotators in what must have been a most exacting task.

GILBERT COTTAM, M.D.

SKETCHES IN PSYCHOSOMATIC MEDICINE. Smith Ely Jelliffe, M.D., New York. 155 pages, including an index. Price \$3.00. New York: Nervous and Mental Disease Monographs (64 W. 56th Street), 1939.

This small book consists of a series of reprints and addresses given by the author at various times. The style is discursive and the language may be somewhat confusing to those not familiar with psychoanalytic terms. An indication of the style is found in Dr. Jelliffe's own comment: "As a matter of history I can recall a comment once made by my brother who, listening to me talk when a young man, said that he often held his breath wondering if I would come out all right in my sentence before I got through."

The writer attempts a broad approach to medical problems from the viewpoint of evolution and psychoanalysis. He searches for the meaning, in a general and philosophical way, of human ailments. For example: "Any deviation from Object or Aim (in the Unconscious) is capable of causing disorder or disaster in the delivery of the energy of the human being either at the level of metabolism or at the level of conduct, or both. At the conduct level such disorders or disasters are of social significance chiefly and are dealt with chiefly by legal agencies as antisocial, criminal or delinquent conduct, or by medicine as psychoses and certain psychoneuroses. At the metabolism level, organ disturbances result."

BOOK REVIEWS

An idea of the contents of the book may be obtained by glancing over the chapter headings.

I. What Price Healing?

The author points out the necessity for concomitant psychotherapy along with surgical treatment of some ailments.

II. Psychopathology and Organic Disease

Any deviation from object or aim threatens the harmonious action patterns within the machine.

III. The Death Instinct in Pathology

The author attempts to explain in Freudian terminology, recovery from mental illnesses following severe somatic illnesses or severe operations.

IV. Dupuytren's Contracture

This chapter contains an interesting historical account of Dupuytren's contracture. The author attempts to point out the significance of "strong grasping tendencies."

V. The Psyche and the Vegetative Nervous System

This is an attempt to evaluate the significance of mental factors in the endocrine disorders, especially hyperthyroidism.

VI. Bodily Organs and Psychopathology

This chapter contains an interesting brief developmental history of psychoanalytic psychiatry.

VII. The Skin, Nervous System and the Bath

This skin is discussed from the evolutionary standpoint, starting with the ameba. Eczema and psoriasis are given most attention.

VIII. Neuropathology of Bone Disease

The author reports a case which is supposed to show the relationship of emotional tension, due to unconscious motivation and development of a giant cell tumor of the lower end of the tibia.

IX. Psychoanalysis and Myopia

This chapter is a discussion of the psychologic meaning of the development of myopia in the adolescent.

X. The Ecological Principle in Medicine

This is a brief dissertation on "the adaption of man as a whole to the whole of the cosmos."

The author defines the Neo-Hippocratic physician as one who is not satisfied with the chemical explanation alone, nor biologic nor purely psychologic, but searches for all three. If one has the time and wishes to use it for close study of the material in this book, he is almost certain to increase his breadth of vision in psychosomatic medicine. The problems raised are of great interest and the author's contentions are engaging, but they suffer from lack of genuine proof and close reasoning.

ALEX BLUMSTEIN, M.D.

FUNCTIONAL DISORDERS OF THE FOOT; THEIR DIAGNOSIS AND TREATMENT. Frank D. Dickson, M.D., and Rex L. Diveley, M.D. 305 p. Illus. \$5.00. Philadelphia: J. B. Lippincott Co., 1939.

This book is one which every practicing physician should own. Painful feet are a cause of so much dis-

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*"Treatment of Acute Anterior Urethritis with Silver Picrate," Knight and Shelanski, *AMERICAN JOURNAL OF SYPHILIS, GONORRHEA AND VENEREAL DISEASES*, Vol. 23, No. 2, pages 201-206, March, 1939.

JOHN WYETH & BROTHER, INCORPORATED, PHILADELPHIA, PA.

BOOK REVIEWS

ability and the complaint is so common that there are few doctors who are not consulted almost daily by their patients for this reason. Without going into the evolution, anatomy and physiology of the feet more than is necessary for an intelligent approach to the more practical side of functional disorders, the authors give enough of these subjects to allow the general practitioner who uses the book to handle many of his cases without requiring orthopedic consultation.

The subjects of imbalance and of proper shoeing are so adequately covered that a full understanding of these chapters will allow one to treat with confidence the large majority of cases seeking relief. The less common ailments are also thoroughly covered and their discussion rounds out a book which is certainly an outstanding one on the subjects treated. It can be unqualifiedly recommended to anyone with an interest in foot disorders.

WALLACE H. COLE, M.D.

SHOCK. BLOOD STUDIES AS A GUIDE TO THERAPY. John Scudder, M.D., Med. Sc.D., F.A.C.S. 315 pages. 55 illustrations. 5 plates (3 in color). Philadelphia: J. B. Lippincott Co., 1939.

This book is primarily concerned with the results of a new treatment of shock. It brings out the importance of potassium in the etiology of shock and emphasizes the blood changes which take place in this state. It presents the different theories of shock and also the present-day types of treatment of this condition. This portion is a beautifully condensed summary of the different methods of treatment and an evaluation of them. The author then presents in detail experiments illustrating hemo-concentration and changes in potassium in experimental shock. He stresses the importance of the determination of cell volume, specific gravity of whole blood, specific gravity of plasma, amount of plasma proteins and includes as a supplement a concise laboratory manual for determination of this data. He then includes detailed blood studies in 28 cases of post-operative shock, shock due to trauma alone, shock due to trauma complicated with hemorrhage, shock due to hemorrhage, shock due to burn, shock due to perforated duodenal ulcer and primary shock. Treatment with suprarenal cortex is then discussed. He includes at the end three historical and chronological sketches on developments in the conception and treatment of shock, developments in the physiological and toxicologic effects of potassium and developments in some of the functions of the adrenal glands.

The bibliography contains 533 references. A very interesting feature is the insertion of blank pages at various points for additional notes of the reader.

Although this book contains a great deal of experi-

mental data, which might prove somewhat laborious for the casual reader, the résumé of the whole subject of shock is so concise and informative that it is well worth a close study. It will prove of value not only to those interested in the experimental side of shock but also to those who are of necessity more interested in the practical side.

WALLACE P. RITCHIE, M.D.

ELECTROCARDIOGRAPHIC PATTERNS — THEIR DIAGNOSTIC AND CLINICAL SIGNIFICANCE. Arlie F. Barnes, M.D., The Mayo Clinic, Rochester, Minnesota. 197 pages. Illus. Price \$5.00. Springfield, Illinois: Charles C. Thomas, 1939.

The voluminous contributions to the current literature of recent years on electrocardiographic changes incident to myocardial effects associated with many clinical conditions has made welcome Dr. Barnes' monograph. No attempt is made to discuss the fundamentals of electrocardiography on the subject of arrhythmias which have been amply covered by previous publications. However, in this treatise the author has brought together in an orderly fashion, well illustrated, the significant contributions to this field, many of which are the results of his own investigations.

The combinations of alteration from the normal of the contours, voltage and time relations of the usual electrocardiographic leads are designated as patterns. These patterns have been described as quite definite indications of the presence of certain clinical conditions. Most important of these is coronary vascular occlusion, the patterns of which are well described in both the acute and chronic forms. Of particular interest are the author's descriptions of the patterns seen in conditions putting undue strain on one or the other ventricle, and his evidence indicating that they are due to metabolic factors incident to the strain rather than actually demonstrable changes in the myocardium.

The descriptions of the patterns seen in pericarditis and the effects of various drugs, metabolic disorders and infections on the electrocardiogram are especially important in that they call attention to the fact that such changes can occur. They show how the records may lead to consideration of these conditions, otherwise unsuspected.

It is unfortunate that the illustrations of the fourth lead could not be given as taken with the technic recommended by the Committee for the Standardization of Precordial Leads. This cannot be regarded as a serious criticism, but rather the penalty any monograph must pay in presenting a subject in which knowledge is advancing so rapidly.

JOSEPH F. BORG, M.D.